

TIRE PRESSURE WARNING SYSTEM

PRECAUTION

1. TIRE PRESSURE WARNING SYSTEM PRECAUTION

- (a) When the tire pressure warning light turns on, immediately check the tire pressure of the tire and adjust it to the specified value. (When the tire pressure warning light circuit is open, the tire pressure warning light flashes for 1 minute and then illuminates.)

NOTICE:

Check the spare tire as well since this system monitors the pressure of all tires.

Standard pressure:

220 kPa (2.2 kgf/cm², 32 psi)

- (b) When the tire pressure warning light blinks, there is a malfunction in the system. Check for DTCs.
- (c) It is necessary to register the transmitter ID in the tire pressure warning ECU after replacing the tire pressure warning valve and transmitter and/or tire pressure warning ECU (see page TW-9).
- (d) When replacing the tire pressure warning ECU:
 - (1) Using the DATA LIST, read the transmitter IDs registered in the ECU and make a note of them before removing the tire pressure warning ECU.
 - (2) Register the transmitter IDs after installing a new tire pressure warning ECU.
- (e) When replacing the tire pressure warning valve and transmitter:
 - (1) Take a note of the 7 digit number (transmitter ID) written on the tire pressure warning valve and transmitter when replacing it. Register the transmitter IDs in the tire pressure warning ECU after replacing the tire pressure warning valve and transmitter and installing the tires and wheels on the vehicle.

NOTICE:

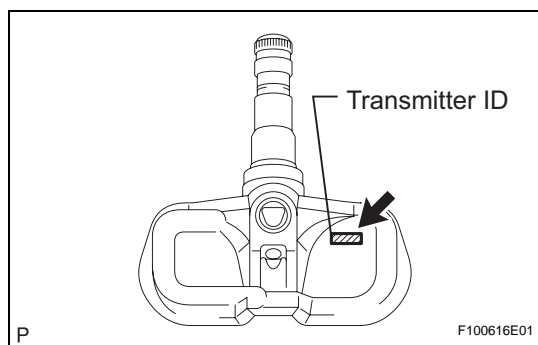
The transmitter ID written on the tire pressure warning valve and transmitter will be unable to be read after installing it on the tire and wheel.

2. IN CASE OF TIRE AND WHEEL REPLACEMENT

- (a) When tires and wheels are replaced, always be sure to register the transmitter ID correctly.

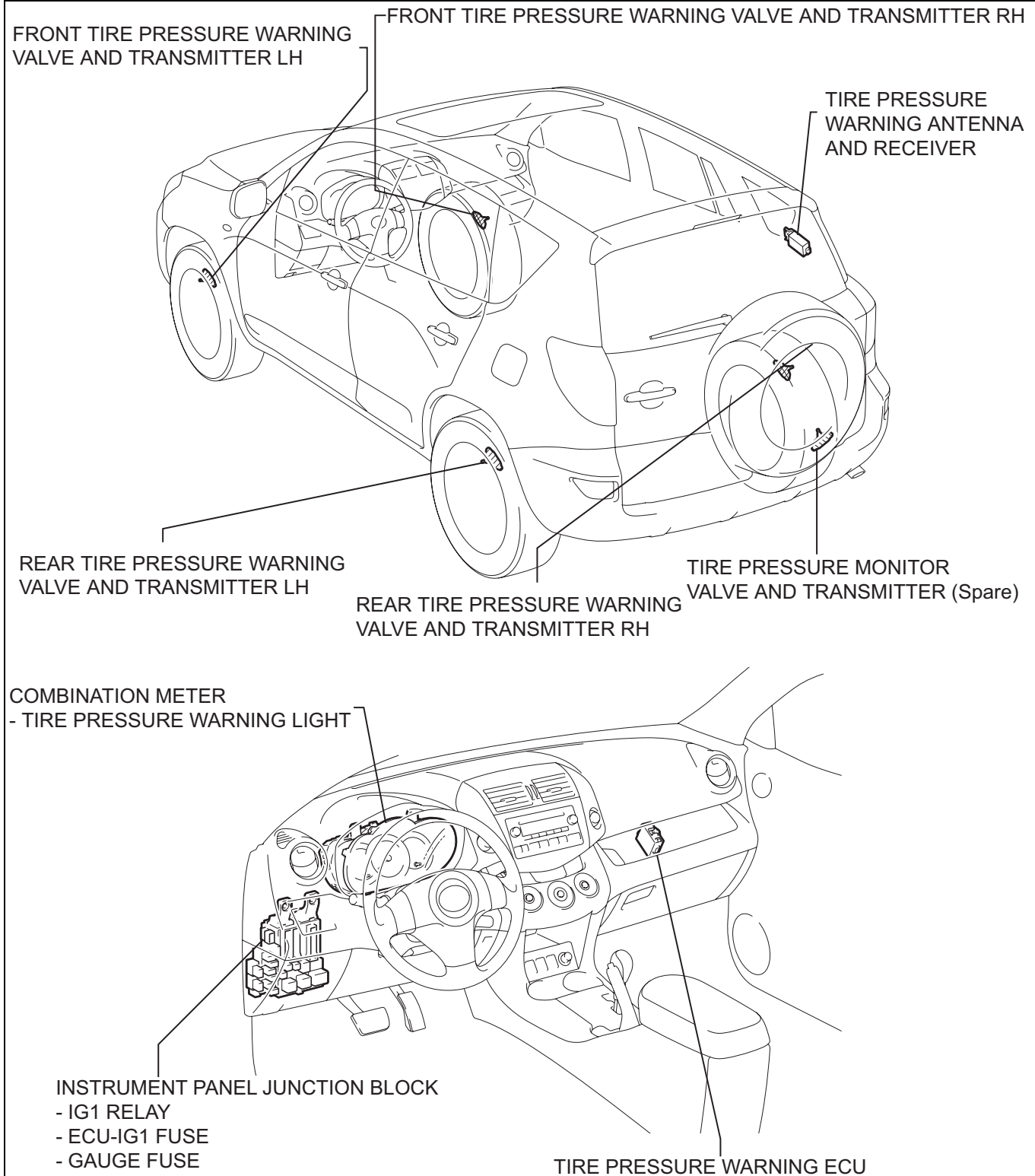
3. FAIL-SAFE FUNCTION

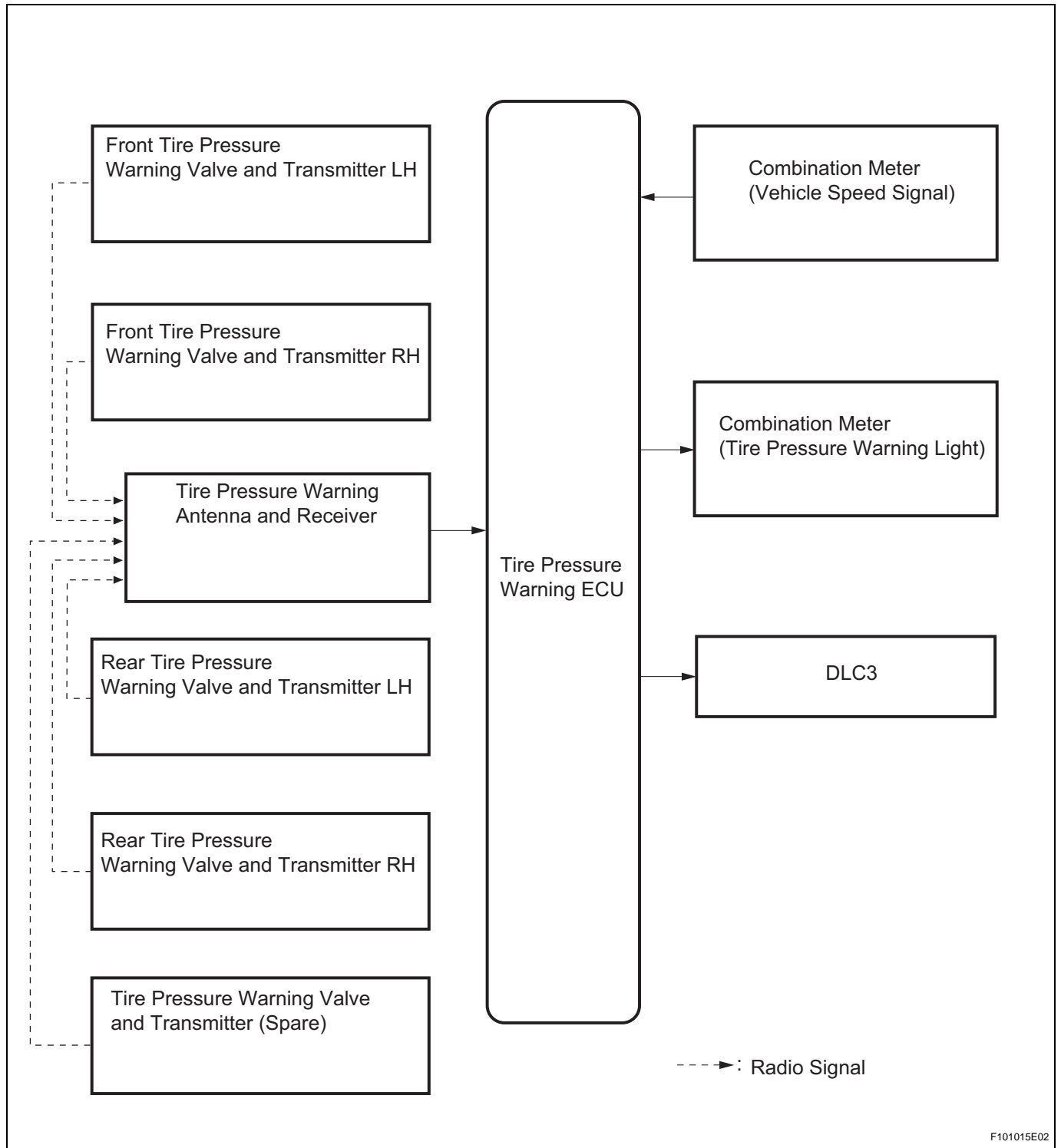
- (a) When a system malfunction occurs in the tire pressure warning system, the tire pressure warning light blinks and informs the driver of the system failure.
- (b) The result of this diagnosis is stored in the tire pressure warning ECU.



- (c) Precautions about the tire pressure:
- The tire pressure decreases naturally.
 - In winter, tire pressure may decrease due to low ambient temperature (tire pressure decreases by approximately 10 kPa (0.2 kgf/cm², 1.45 psi) for every 10°C (50°F) drop in the ambient temperature).
- Therefore, the tire pressure warning is more likely to operate if the tire pressure are not adjusted appropriately.
- If the daily temperature variation is large, adjust the tires to a higher pressure suitable to cold conditions.
- This will reduce the likelihood of an incorrect tire pressure warning operation.

PARTS LOCATION

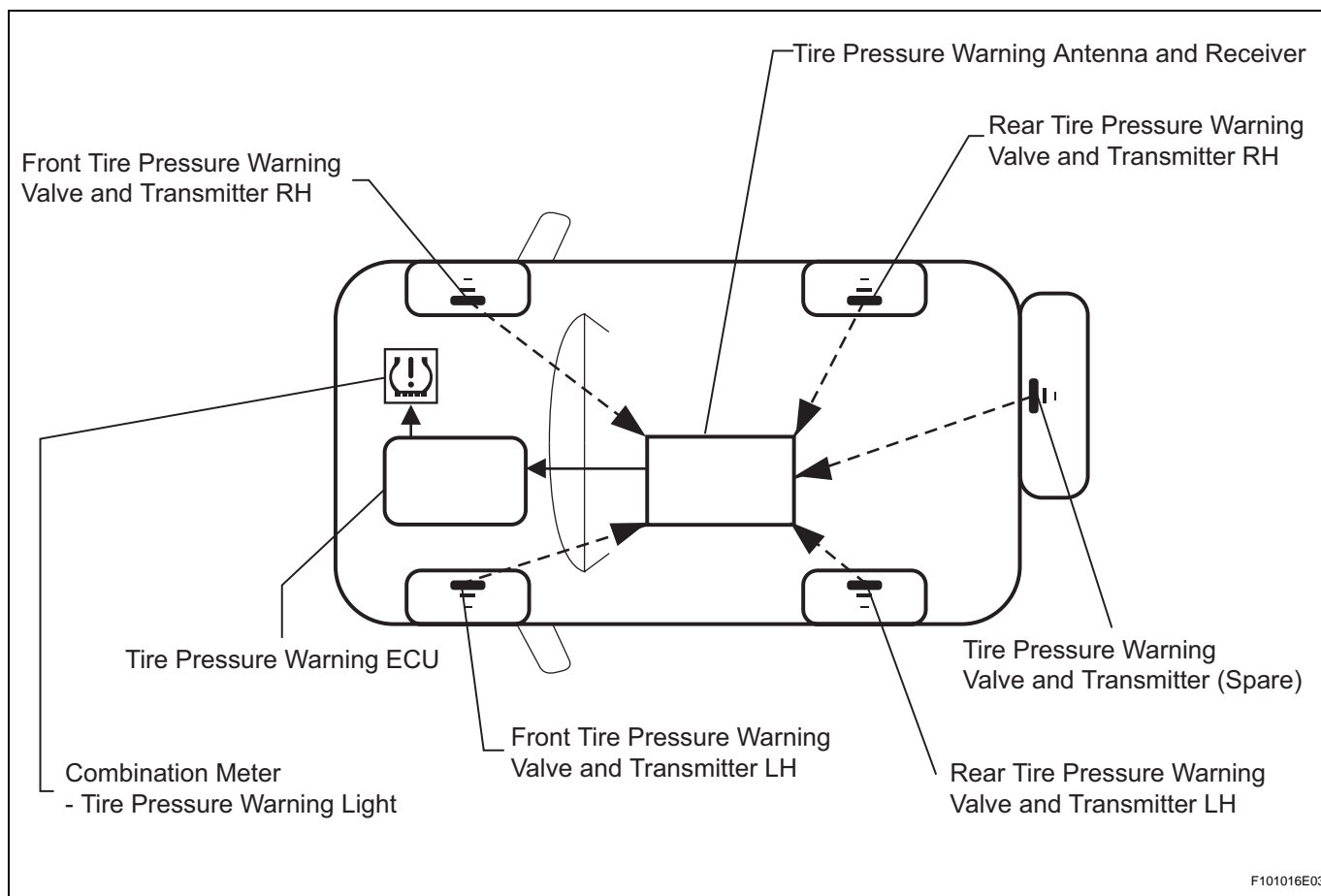


SYSTEM DIAGRAM**TW**

SYSTEM DESCRIPTION

1. DESCRIPTION OF SYSTEM

- (a) A tire pressure warning antenna and receiver is equipped with a tire pressure sensor and a transmitter and is installed in each tire wheel. The sensor measures the tire pressure and internal temperature of the tire. Then the measured value and transmitter ID are transmitted to the tire pressure monitor receiver on the body as radio waves, which are sent to the tire pressure warning ECU. If the transmitter ID has already been registered, the ECU compares the measured air pressure value with the standard value. When the value is less than the standard value registered in the tire pressure warning ECU, the warning light in the combination meter turns on.



2. WHEN TIRE PRESSURE WARNING LIGHT IS LIT

- (a) When the tire pressure warning light does not turn off, or when it turns on during driving, check the tire pressure. If the tire pressure warning light turns on within several hours after adjusting the tire pressure, the tire may have a slow air leak.

- (b) Under the following conditions, the system may not function properly;
- Areas, facilities or devices that use similar radio frequencies are located in the vicinity of the vehicle.
 - Devices using similar radio frequencies are used in the vehicle.
 - Large amounts of snow or ice are stuck to the vehicle, especially on the wheels and around the wheel houses.
 - The battery of the transmitter is depleted.
 - Tires and wheels without tire pressure warning valves and transmitters are used.
 - Snow tires and tire chains are used.
 - If wheels other than the specified ones are used, the system may not function properly because different radio waves are transmitted from the tire pressure warning valve and transmitter.
 - Depending on the tire type, the tire pressure warning valve and transmitter may not function properly even though the specified wheels are used.
 - The system may not function properly if it is initialized with tire pressures which are not the specified values.
- (c) The average life of the grommet of the tire pressure warning antenna and receiver is approximately 5 years, at which time it must be replaced. Retighten the valve nut if the valve is leaking air, if it is less than 5 years old, and there is no problem with the grommets.
- (d) After removing and installing the ECU or a sensor, output a diagnosis code and check that it is a normal code.

TW

3. FUNCTION OF COMPONENTS

Components	Function
Tire pressure warning antenna and receiver	<ul style="list-style-type: none"> • Combined as a single unit with a disc wheel air valve, it measures tire pressure and temperature, and transmits an ID number for measurement value and identification • Battery is built into valve
Tire pressure warning antenna and receiver	Receives necessary signals from tire pressure warning antenna and receiver and transmits them to tire pressure warning ECU
Tire pressure warning ECU	<ul style="list-style-type: none"> • Receives signal from receiver and identifies it as vehicle's own signal. • If measurement value is equal to or lower than specified value, it transmits a signal so that the air pressure warning light on combination meter turns on.
Tire pressure warning light	Located in the combination meter, it informs driver of lowered tire air pressure and system failure

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:

- Use these procedures to troubleshoot the tire pressure warning system.
- *: Use the intelligent tester.

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 INSPECT BATTERY VOLTAGE

Standard voltage:

11 to 14 V

If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

3 CHECK INDICATOR LIGHT

(a) Check the indicator light (see page [TW-17](#)).

NEXT

4 CHECK DTC*

- (a) Check for DTC (see page [TW-20](#)).
 (b) Clear the DTC (see page [TW-20](#)).
 (c) Recheck for DTC (see page [TW-20](#)).

Result

Result	Proceed to
DTC reoccurs	A
DTC does not reoccur	B

B

Go to step 6

A

5 DTC CHART

- (a) Check for tire pressure warning system DTC output (see page [TW-22](#)).

NEXT

6 PROBLEM SYMPTOM CONFIRMATION**NEXT****7 PROBLEM SYMPTOMS TABLE****Result**

Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B**Go to step 9****A****8 OVERALL ANALYSIS AND TROUBLESHOOTING***

- (a) Terminals of ECU (see page [TW-16](#)).
 (b) DATA LIST/ACTIVE TEST (see page [TW-21](#)).

NEXT**9 REPAIR OR REPLACE****NEXT****10 CONFIRMATION TEST****NEXT****END****TW**

REGISTRATION

1. IN CASE OF TIRE PRESSURE WARNING ECU REPLACEMENT
- (a) Read ID stored in the old ECU using the intelligent tester.
2. IN CASE OF TIRE PRESSURE WARNING VALVE AND TRANSMITTER AND/OR TIRE PRESSURE WARNING ECU REPLACEMENT
- (a) Read the ID written on the tire pressure monitor valve.

3. REGISTER TRANSMITTER ID

NOTICE:

It is necessary to register the transmitter ID in the tire pressure warning ECU when replacing the tire pressure warning valve and transmitter and/or tire pressure warning ECU.

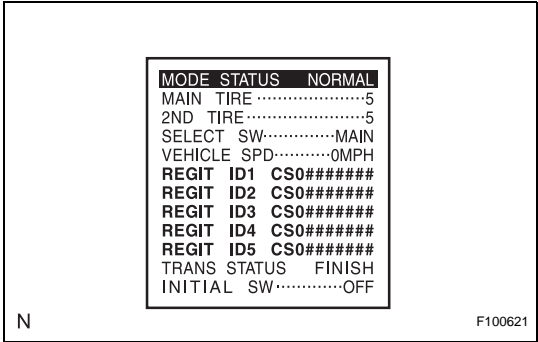
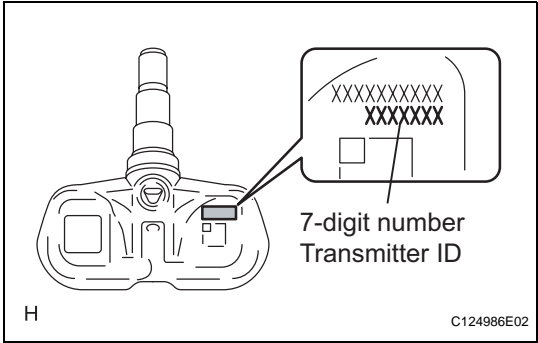
- (a) Prepare all of the transmitter ID data before starting registration.

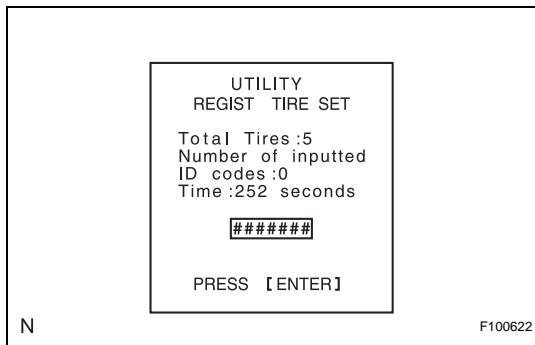
HINT:

- Read the registered transmitter IDs that are stored in the ECU using the intelligent tester and make a note of them.

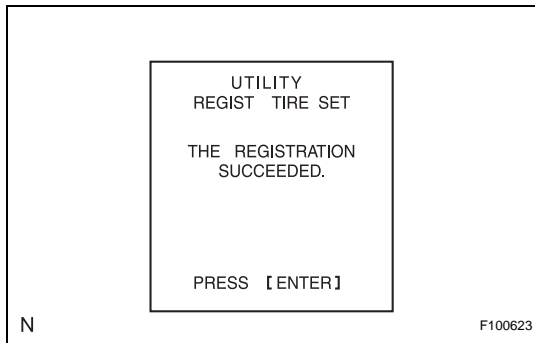
• If reading stored transmitter IDs is impossible due to malfunctions of components such as the tire pressure warning antenna and receiver, remove the tires from the wheels and check the IDs located on the tire pressure warning valves and transmitters (see page TW-60).

• When replacing the tire pressure warning valves and transmitters, make a note of the IDs written on the tire pressure warning valves and transmitters.
- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (c) Turn the ignition switch ON.
- (d) *1: Read and write down the ID (ID1 to ID5) by using the DATA LIST.





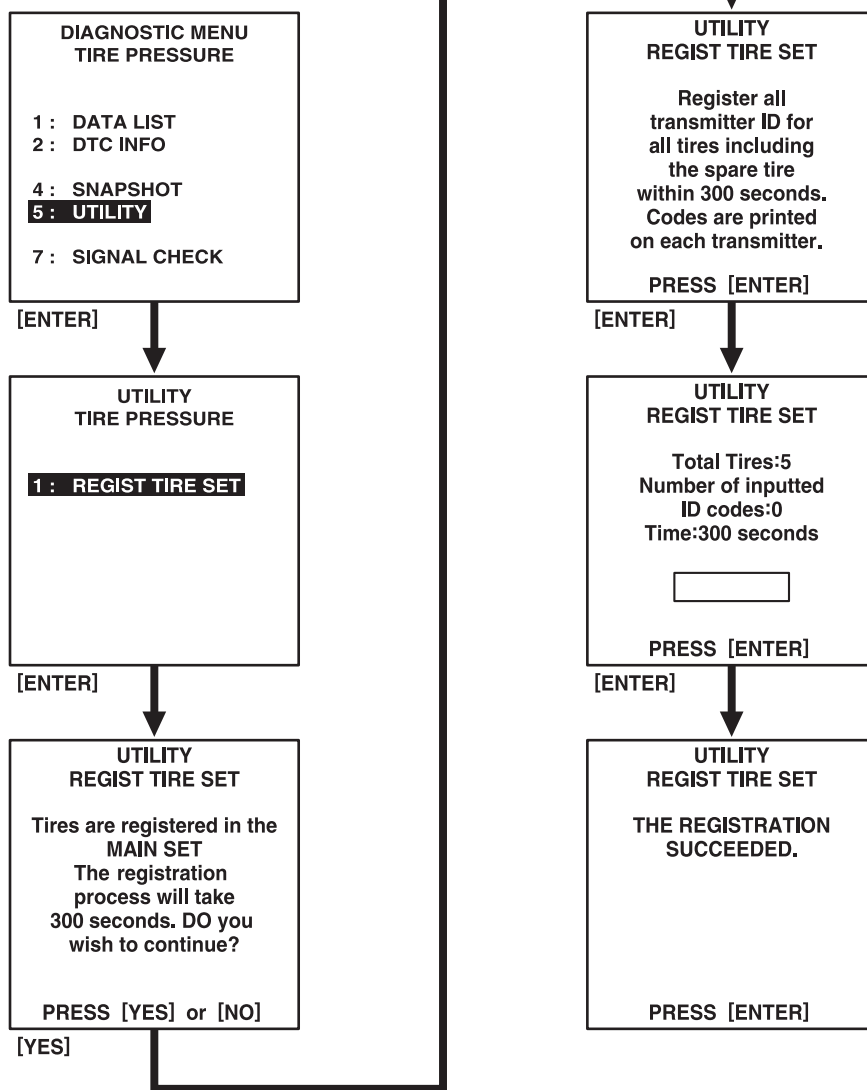
- (e) *2: Select REGIST TIRE SET following the intelligent tester screen (UTILITY - REGIST TIRE SET).
- (f) *3: Select the registration mode "MAIN".



- (g) Input the ID (ID1 to ID5) using the intelligent tester and transmit it to the tire pressure warning ECU.

- (h) Set the ID transmission condition to "ID Registration is complete".

Registration Procedure



F101083E01

HINT:

- The previously registered IDs will be deleted from the memory when the registration is completed.
- If the operations of *1 to *3 are not completed within 5 minutes, the mode will return to normal operation mode.

4. CONFIRMATION OF TRANSMITTER ID REGISTRATION

- (a) Set the tire pressure of all wheels (including the spare tire) to the specified value.

Standard pressure:

220 kPa (2.2 kgf/cm², 32 psi)

- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (c) Turn the ignition switch ON.
- (d) Select "SIGNAL CHECK" mode on the intelligent tester (with CAN VIM) (see page [TW-12](#)).
- (e) Confirm that the transmitter IDs and tire pressure data for all the tires are displayed on the intelligent tester screen.

NOTICE:

- It may take up to 1 minute to update the tire pressure data.
- If the IDs have not been registered, DTC C2171/71 is set in the tire pressure warning ECU after approximately 60 minutes.

TEST MODE PROCEDURE

1. TEST MODE CHECK

HINT:

- When entering the TEST MODE, the tire pressure warning ECU sets all the test DTCs first. After completing the test mode for each inspection item, the DTCs that are determined normal by the tire pressure warning ECU will be erased.

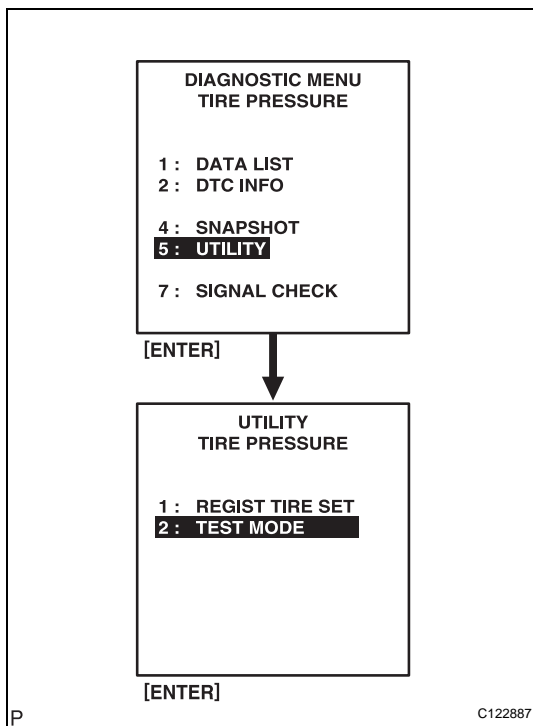
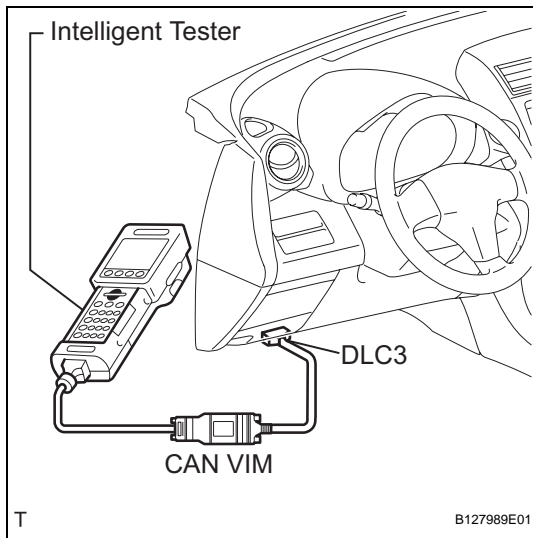
The DTCs for other inspection items may not be erased when only a certain signal is inspected.

- When the test mode returns back to the normal mode, all the test DTCs will be erased.

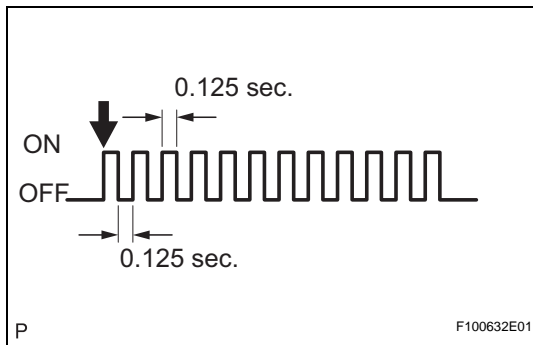
(a) Make sure that the ignition switch is OFF.

(b) Connect the intelligent tester (with CAN VIM) to the DLC3.

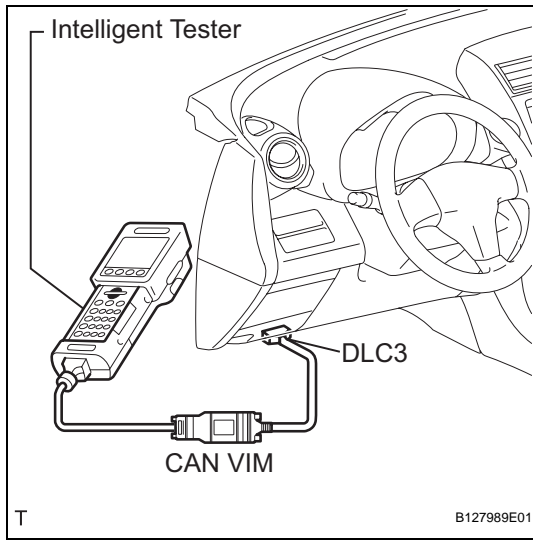
(c) Turn the ignition switch ON.



(d) Select TEST MODE on the intelligent tester.



- (e) Confirm that the tire pressure warning light in the combination meter blinks at 0.125 second intervals.

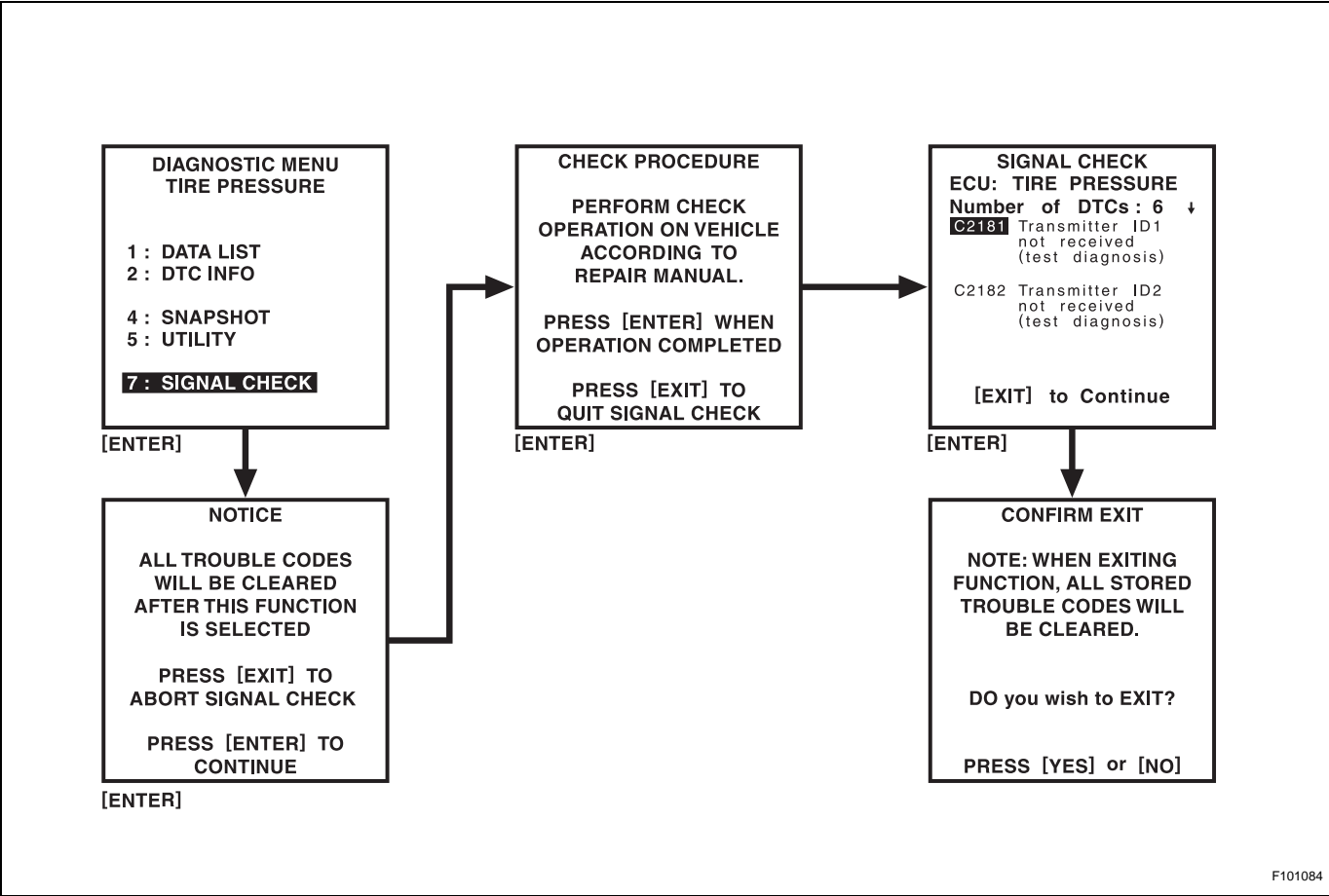


2. PERFORM SIGNAL CHECK

HINT:

- When entering the signal check, the tire pressure warning ECU sets all the signal check DTCs first. After completing the signal check for each inspection item, the DTCs that are determined normal by the tire pressure warning ECU will be erased. The DTCs for other inspection items may not be erased when only a certain signal is inspected.
 - When the signal check returns back to normal mode, all the signal check DTCs will be erased.
- (a) Make sure that the ignition switch is OFF.
 - (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
 - (c) Turn the ignition switch ON.
 - (d) Select SIGNAL CHECK on the intelligent tester.
 - (e) Drive the vehicle at 12 mph (20 km/h) or more for 10 seconds or more .

- (f) Loosen the valve core and rapidly reduce the pressure (above 40 kPa / 30 seconds or more).



HINT:
The transmitter ID can be transmitted by rapidly reducing the tire pressure.

- (g) Result
- HINT:
After the signal check is completed, check for a DTC and signal check DTC to confirm the system status.

Condition	Procedure
SIGNAL CHECK DTC is output	Repair faulty part and enter SIGNAL CHECK again
SIGNAL CHECK DTCs are cleared	No problem

- (h) End of SIGNAL CHECK
- After completing test mode (SIGNAL CHECK), turn the ignition switch OFF and disconnect the tester.
- DTC of SIGNAL CHECK (TEST DIAGNOSIS) function:**
- If a malfunction code is displayed during the test mode DTC check, check the circuit listed for that code. For details of each code, refer to the "see page" of the "DTC No." in the chart.

DTC No.	Detection Item	Trouble Area	See page
C2181/81	Transmitter ID1 not received	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness 	TW-28
C2182/82	Transmitter ID2 not received	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness 	TW-28
C2183/83	Transmitter ID3 not received	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness 	TW-28
C2184/84	Transmitter ID4 not received	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness 	TW-28
C2185/85	Transmitter ID5 not received	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness 	TW-28
C2191/91	Vehicle speed signal error	<ul style="list-style-type: none"> • Vehicle speed sensor • Tire pressure warning ECU • Combination meter • Wire harness 	TW-44

PROBLEM SYMPTOMS TABLE

HINT:

- Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.
- Inspect the fuses and relays related to this system before inspecting the suspected areas below.

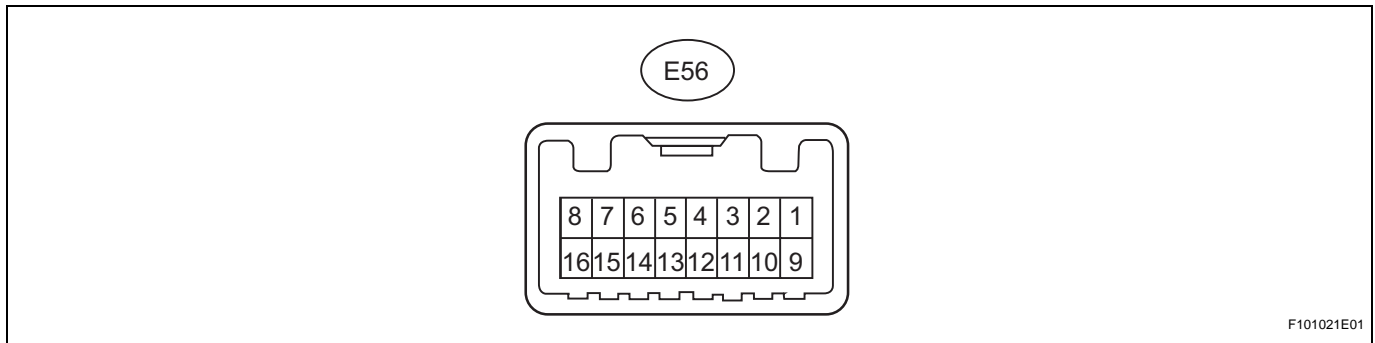
Tire pressure warning system

Symptom	Suspected area	See page
Tire pressure warning system does not operate	1. ECU power source circuit	TW-49
	2. TC and CG terminal circuit	TW-51
	3. Tire pressure warning valve and transmitter	TW-60
	4. Combination meter	ME-52
	5. Tire pressure warning antenna and receiver	TW-53
	6. Tire pressure warning ECU	TW-64
DTC check cannot be completed	1. ECU Power source circuit	TW-49
	2. TC and CG terminal circuit	TW-51
	3. Tire pressure warning ECU	TW-64
Tire pressure warning light malfunctions (Does not turn on)	1. ECU Power source circuit	TW-49
	2. Tire pressure warning light circuit	TW-47
	3. Combination meter	ME-52
	4. Tire pressure warning ECU	TW-64
Tire pressure warning light malfunctions (Remains on)	1. Tire pressure check	TW-2
	2. Tire pressure warning ECU connector poorly connected	-
	3. Tire pressure warning light circuit	TW-47
	4. Combination meter	ME-52
	5. Tire pressure warning ECU	TW-64
Tire pressure warning light malfunctions (Blinking)	1. Check DTC	TW-20
	2. TC and CG terminal circuit	TW-51
	3. Test mode (SIGNAL CHECK)	TW-12
	4. Tire pressure warning ECU	TW-64

TW

TERMINALS OF ECU

1. CHECK TIRE PRESSURE WARNING ECU



- (a) Disconnect the E56 ECU connector.
- (b) Measure the voltage and resistance of the wire harness side connector.

Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
IG (E56-2) - GND (E56-11)	L - W-B	IG power source	Ignition switch ON	10 to 14 V
			Ignition switch OFF	Below 1 V
GND (E56-11) - Body ground	W-B - Body ground	Ground	Always	Below 1 Ω

If the result is not as specified, there may be a malfunction on the wire harness side.

- (c) Reconnect the E56 ECU connector.
- (d) Measure the voltage of the connector.

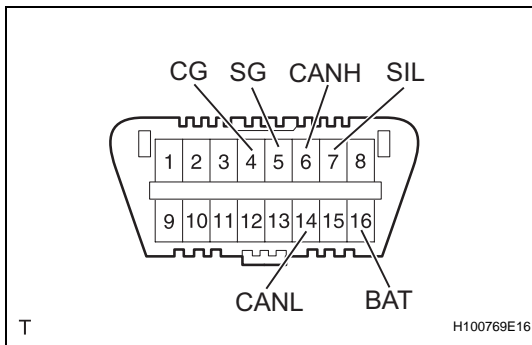
Symbols (Terminal No.)	Wiring Color	Terminal Description	Condition	Specified Condition
SPD (E56-3) - GND (E56-11)	V - W-B	Vehicle speed signal	Vehicle is running	Pulse generation
SIL (E56-4) - GND (E56-11)	W - W-B	Diagnosis tester communication line	Ignition switch ON, when communication is not performed with a tester	8 to 15 V
IND (E56-6) - GND (E56-11)	P - W-B	Tire pressure warning light output signal	Ignition switch ON, tire pressure warning light ON	Below 1 V
RDA (E56-7) - GND (E56-11)	G - W-B	Tire pressure monitor receiver signal	Ignition switch ON, tire pressure monitor receiver is not connected	9 to 16 V
RFSV (E56-8) - GND (E56-11)	R - W-B	Tire pressure monitor receiver power source	Ignition switch ON	4.5 to 5.5 V
TC (E56-12) - GND (E56-11)	G - W-B	TC terminal	When terminal TC is not connected	8 to 15 V
GND2 (E56-16) - Body ground	Y - Body ground	Tire pressure monitor receiver ground	Always	Below 1 V

If the result is not as specified, the ECU may have a malfunction.

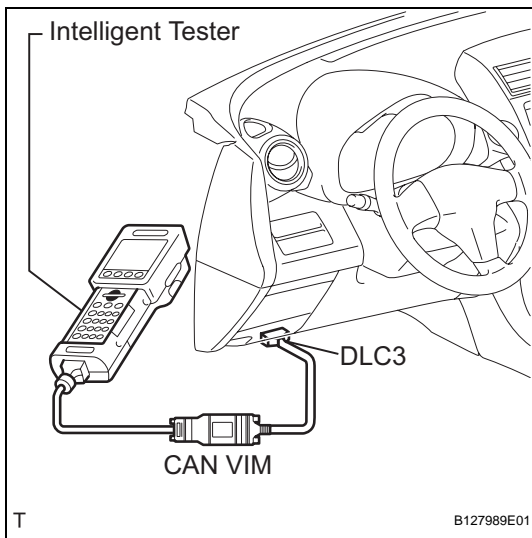
DIAGNOSIS SYSTEM

1. CHECK DLC3

The ECM uses ISO 15765-4 for communication. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 15765-4 format.



Symbols (Terminals No.)	Terminal Description	Condition	Specified Condition
SIL (7) - SG (5)	Bus '+' line	During transmission	Pulse generation
CG (4) - Body ground	Chassis ground	Always	Below 1 Ω
SG (5) - Body ground	Signal ground	Always	Below 1 Ω
BAT (16) - Body ground	Battery ground	Always	11 to 14 V
CANH (6) - CANL (14)	HIGH-level CAN bus line	Ignition switch OFF	54 to 69 Ω
CANH (6) - Body ground	HIGH-level CAN bus line	Ignition switch OFF	1 M Ω or higher
CANH (6) - CG (4)	HIGH-level CAN bus line	Ignition switch OFF	1 M Ω or higher
CANL (14) - Body ground	LOW-level CAN bus line	Ignition switch OFF	1 M Ω or higher
CANH (6) - CG (4)	LOW-level CAN bus line	Ignition switch OFF	1 M Ω or higher



If the result is not as specified, the DLC3 may have a malfunction. Repair or replace the harness and connector.

HINT:

Connect the cable of the intelligent tester (with CAN VIM) to the DLC3, turn the ignition switch ON and attempt to use the tester. If the display indicates that a communication error has occurred, there is a problem with the vehicle or with the tester.

- If communication is normal when the tester is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected to another vehicle, the problem is probably in the tester itself. So consult the Service Department listed in the tester's instruction manual.

2. DIAGNOSIS SYSTEM

(a) Warning light

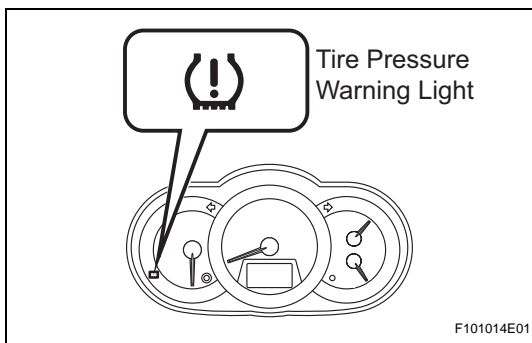
- (1) The tire pressure warning light blinks when there is a malfunction in the tire pressure warning system.

NOTICE:

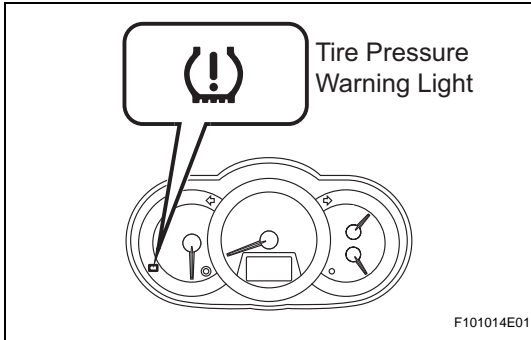
When the malfunction has been corrected, the tire pressure warning light does not turn on.

(b) DTCs (Normal mode)

- (1) DTCs are memorized in the tire pressure warning ECU. These DTCs can be read by checking the blinks of the tire pressure warning light or by using the intelligent tester (see page TW-20).



- (c) Test mode
 (1) By switching from normal mode to test mode (input signal check), you can inspect the tire pressure monitor receiver, each tire pressure warning valve and transmitter and vehicle speed sensor (see page [TW-12](#)).



3. CHECK TIRE PRESSURE WARNING LIGHT

- (a) Turn the ignition switch ON.
 (b) Check that the tire pressure warning light turns on for 3 seconds.
 If the warning check result is not normal, proceed to the troubleshooting for the tire pressure warning light circuit.

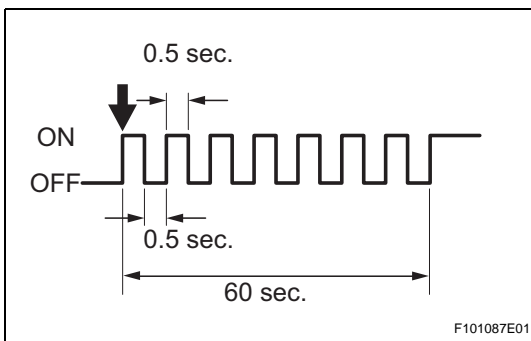
Trouble Area	See page
Tire pressure warning light circuit	TW-47

4. TIRE PRESSURE WARNING LIGHT CHART

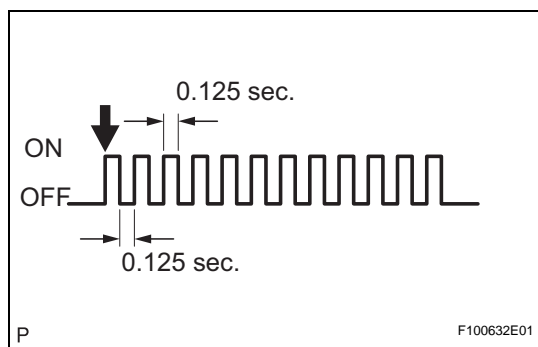
HINT:

The table below indicates the state of the tire pressure warning light after the ignition switch is turned ON.

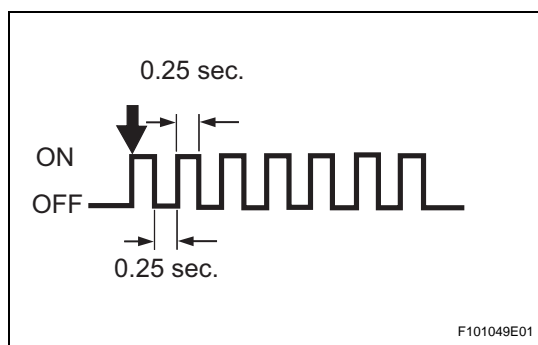
	Immediately after turning the ignition switch ON	Always					
		Warning light output pattern					
	Turns on for 3 seconds	Turns off	Turns on	Flashes for 1 minute and then illuminates (*1)	Blinks (*2)	Blinks (*3)	Output DTC
Normal	○	○					
Low tire pressure	○		○				
System fail	○			○			
Test mode	○				○		
ECU connector poorly connected	○			○			
TC ground (DTC is output)	○						○
TC ground (DTC is not output)	○		○				



*1: Turns on and turns off repeatedly at 0.5 second intervals.



*2: Turns on and turns off repeatedly at 0.125 second intervals.



*3: Turns on and turns off repeatedly at 0.25 second intervals.

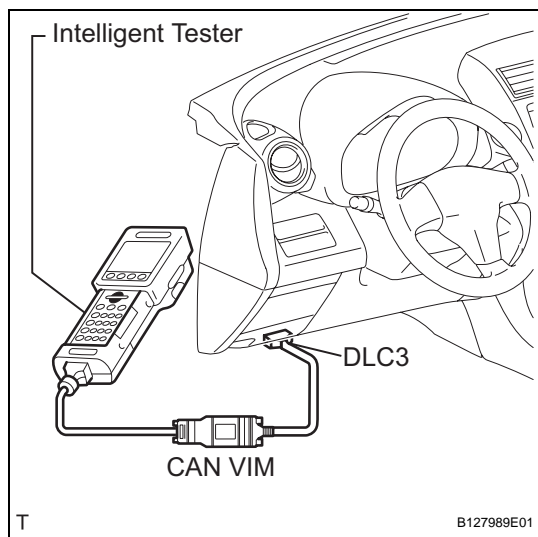
DTC CHECK / CLEAR

1. DTC CHECK (USING INTELLIGENT TESTER)

- Connect the intelligent tester (with CAN VIM) to the DLC3.
- Turn the ignition switch ON.
- Read the DTCs following the prompts on the tester screen.

HINT:

Refer to the intelligent tester operator's manual for further details.

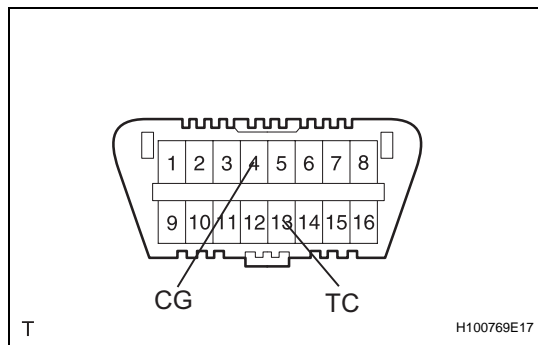


2. CHECK DTC (USING SST CHECK WIRE)

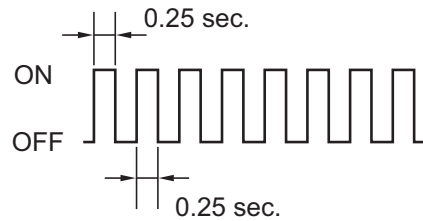
- Using SST, connect terminals 13 (TC) and 4 (CG) of the DLC3.

SST 09843-18040

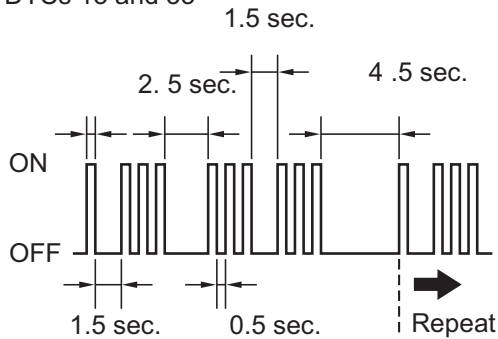
- Turn the ignition switch ON.



Normal System Code



DTCs 13 and 33



F101046E01

- (c) Read and record any DTCs from the tire pressure warning light on the combination meter. Refer to the illustration for examples of a normal system code and DTCs 13 and 33.

HINT:

- If the tire pressure warning light does not blink to indicate any DTCs or the normal system code, inspect the tire pressure warning light circuit or 13 (TC) and 4 (CG) terminal circuits.

Trouble Area	See procedure
Tire pressure warning light circuit	TW-47
TC and CG terminal circuit	TW-51

- If 2 or more malfunctions are indicated at the same time, the lowest numbered DTC is displayed first.
- (d) Refer to the Diagnostic Trouble Code Chart for DTC information (see page [TW-22](#)).
- (e) After completing the check, turn the ignition switch OFF and remove SST from the DLC3.

3. CLEAR DTC (USING INTELLIGENT TESTER)

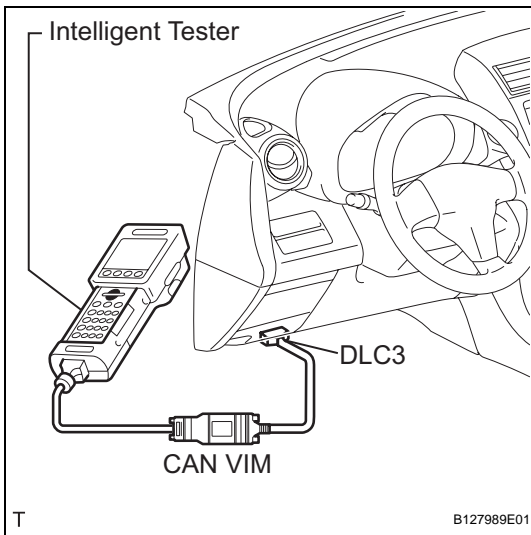
HINT:

After repairing the malfunctions, clear the DTCs.

- (a) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (b) Turn the ignition switch ON.
- (c) Erase the DTCs following the prompts on the tester screen.

HINT:

Refer to the intelligent tester operator's manual for further details.



TW

DATA LIST / ACTIVE TEST

1. READ DATA LIST

HINT:

Using the intelligent tester's DATA LIST allows switch, actuator and other item values to be read without removing any parts. Reading the Data List early in troubleshooting is one way to save time.

- Connect the intelligent tester (with CAN VIM) to the DLC3.
- Turn the ignition switch ON.
- Read the DATA LIST according to the display on the tester.

Tire pressure warning ECU

Item	Measurement item/ Range (Display)	Normal Condition	Diagnostic Note
MODE STATUS	Tire pressure warning system mode / NORMAL or REG 2nd or REG M or TEST	NORMAL: Normal mode TEST: Test mode REG 2nd: 2nd registration REG M: Main registration TEST: Test mode	-
MAIN TIRE	Number of main tire IDs to be registered / 0 or 1 or 2 or 3 or 4 or 5	0 to 5 should be displayed	-
VEHICLE SPEED	Vehicle speed reading / min.: 0 km/h (0 mph), max.: 255 km/h (158 mph)	Actual vehicle speed	Speed indicated on the combination meter
REGIT ID1 CODE	Registered ID1 code / min.: 0, max.: FFFFFFFF	The ID No. registered in transmitter ID1 is displayed	-
REGIT ID2 CODE	Registered ID2 code / min.: 0, max.: FFFFFFFF	The ID No. registered in transmitter ID2 is displayed	-
REGIT ID3 CODE	Registered ID3 code / min.: 0, max.: FFFFFFFF	The ID No. registered in transmitter ID3 is displayed	-
REGIT ID4 CODE	Registered ID4 code / min.: 0, max.: FFFFFFFF	The ID No. registered in transmitter ID4 is displayed	-
REGIT ID5 CODE	Registered ID5 code / min.: 0, max.: FFFFFFFF	The ID No. registered in transmitter ID5 is displayed	-
TRANS STATUS	ID code transmission status / FINISH or NOW	FINISH or NOW	-
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi) max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi) max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi) max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi) max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi) max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

Item	Measurement item/ Range (Display)	Normal Condition	Diagnostic Note
TIRE TEMP1	ID1 temperature in tire / min.: -40°C (-40°F) max.: 215°C (419°F)	Actual tire temperature	-
TIRE TEMP2	ID2 temperature in tire / min.: -40°C (-40°F) max.: 215°C (419°F)	Actual tire temperature	-
TIRE TEMP3	ID3 temperature in tire / min.: -40°C (-40°F) max.: 215°C (419°F)	Actual tire temperature	-
TIRE TEMP4	ID4 temperature in tire / min.: -40°C (-40°F) max.: 215°C (419°F)	Actual tire temperature	-
TIRE TEMP5	ID5 temperature in tire / min.: -40°C (-40°F) max.: 215°C (419°F)	Actual tire temperature	-
BATT VOLT1	ID1 battery voltage / OVER or LESS	OVER	-
BATT VOLT2	ID2 battery voltage / OVER or LESS	OVER	-
BATT VOLT3	ID3 battery voltage / OVER or LESS	OVER	-
BATT VOLT4	ID4 battery voltage / OVER or LESS	OVER	-
BATT VOLT5	ID5 battery voltage / OVER or LESS	OVER	-
# CODES	Number of DTC recorded/ min.: 0 max.: 255	Min.: 0 Max.: -	-

DIAGNOSTIC TROUBLE CODE CHART

HINT:

If a trouble code is displayed during the DTC check, check the circuit listed for that code in the table below. Then proceed to the appropriate page.

Tire pressure warning system

DTC No.	Detection Item	Trouble Area	See page
C2111/11	Transmitter ID1 Operation Stop	- Tire pressure warning valve and transmitter - Tire pressure warning ECU	TW-25
C2112/12	Transmitter ID2 Operation Stop	- Tire pressure warning valve and transmitter - Tire pressure warning ECU	TW-25
C2113/13	Transmitter ID3 Operation Stop	- Tire pressure warning valve and transmitter - Tire pressure warning ECU	TW-25
C2114/14	Transmitter ID4 Operation Stop	- Tire pressure warning valve and transmitter - Tire pressure warning ECU	TW-25
C2115/15	Transmitter ID5 Operation Stop	- Tire pressure warning valve and transmitter - Tire pressure warning ECU	TW-25
C2121/21	No Signal from Transmitter ID1 in Main Mode	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2122/22	No Signal from Transmitter ID2 in Main Mode	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2123/23	No Signal from Transmitter ID3 in Main Mode	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2124/24	No Signal from Transmitter ID4 in Main Mode	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2125/25	No Signal from Transmitter ID5 in Main Mode	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2141/41	Transmitter ID1 Error	- Tire pressure warning valve and transmitter	TW-34
C2142/42	Transmitter ID2 Error	- Tire pressure warning valve and transmitter	TW-34
C2143/43	Transmitter ID3 Error	- Tire pressure warning valve and transmitter	TW-34
C2144/44	Transmitter ID4 Error	- Tire pressure warning valve and transmitter	TW-34
C2145/45	Transmitter ID5 Error	- Tire pressure warning valve and transmitter	TW-34

DTC No.	Detection Item	Trouble Area	See page
C2165/65	Abnormal Temperature Inside ID1 Tire	- Tire - Tire pressure warning valve and transmitter	TW-36
C2166/66	Abnormal Temperature Inside ID2 Tire	- Tire - Tire pressure warning valve and transmitter	TW-36
C2167/67	Abnormal Temperature Inside ID3 Tire	- Tire - Tire pressure warning valve and transmitter	TW-36
C2168/68	Abnormal Temperature Inside ID4 Tire	- Tire - Tire pressure warning valve and transmitter	TW-36
C2169/69	Abnormal Temperature Inside ID5 Tire	- Tire - Tire pressure warning valve and transmitter	TW-36
C2171/71	Transmitter ID not Registered in Main Mode	- Tire pressure warning ECU	TW-39
C2176/76	Receiver Error	- Tire pressure warning and receiver - Tire pressure warning ECU - Wire harness	TW-41
C2181/81	Transmitter ID1 not Received (Test Mode DTC)	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2182/82	Transmitter ID2 not Received (Test Mode DTC)	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2183/83	Transmitter ID3 not Received (Test Mode DTC)	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2184/84	Transmitter ID4 not Received (Test Mode DTC)	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2185/85	Transmitter ID5 not Received (Test Mode DTC)	- Tire pressure warning valve and transmitter - Tire pressure antenna and receiver - Tire pressure warning ECU - Wire harness	TW-28
C2191/91	Vehicle Speed Signal Error (Test Mode DTC)	- Vehicle speed sensor - Tire pressure warning ECU - Combination meter - Wire harness	TW-44

DTC	C2111/11	Transmitter ID1 Operation Stop
DTC	C2112/12	Transmitter ID2 Operation Stop
DTC	C2113/13	Transmitter ID3 Operation Stop
DTC	C2114/14	Transmitter ID4 Operation Stop
DTC	C2115/15	Transmitter ID5 Operation Stop

DESCRIPTION

The tire pressure warning valve and transmitter that is installed in the tires and wheels measures the air pressure of the tires. The measured values are transmitted to the tire pressure warning receiver on the body as radio waves and then sent to the tire pressure warning ECU. The ECU compares the measured air pressure values with the air pressure threshold. When the measured air pressure values are less than this threshold, the warning light in the combination meter turns on.

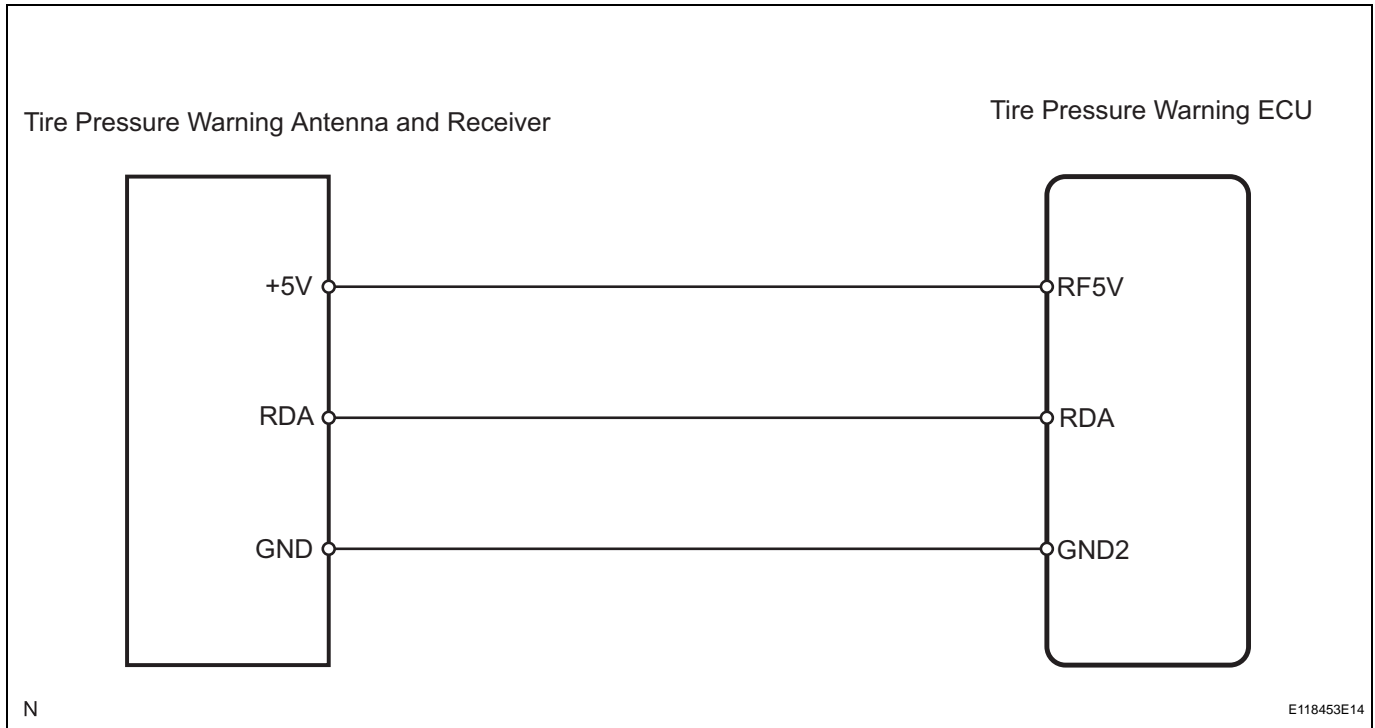
The tire pressure warning ECU stores a DTC when the tire pressure monitor valve stops transmitting signals. At this time, forcibly transmit the signals by releasing the tire pressure rapidly. The stored DTC is cleared when the signal transmission is resumed.

DTC No	DTC Detection Condition	Trouble Area
C2111/11 C2112/12 C2113/13 C2114/14 C2115/15	Tire pressure monitor valve stops transmitting signals	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning ECU

HINT:

It is necessary to perform the procedure to identify the tire pressure monitor valve that is malfunctioning because it cannot be identified by the output DTC.

WIRING DIAGRAM



TW

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning antenna and receiver and/or the tire pressure warning ECU (see page [TW-9](#)).

1

PERFORM FORCED TRANSMISSION OF TRANSMITTER ID OF ALL WHEELS

- Set the pressure of each tire to the specified value.
Standard pressure:
220 kPa (2.2 kgf/cm², 32 psi)
- Connect the intelligent tester (with CAN VIM) to the DLC3.
- Turn the ignition switch ON.
- Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

(e) Rapidly release the pressure from each wheel by approximately 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

(1) Check that each tire pressure data displayed on the intelligent tester screen changes.

OK:

The tire pressure data displayed on the intelligent tester screen changes with the value of the tire pressure.

NOTICE:

- It may take up to 1 minute to display the updated tire pressure data.
- When the TIREPRESS data (IDs 1 to 5) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.

(2) After confirming that the tire pressure data displayed on the intelligent tester screen has changed, set the pressure of each tire to the specified value.

Standard pressure:

220 kPa (2.2 kgf/cm², 32 psi)

HINT:

If the tire pressure data displayed on the intelligent tester screen has not changed after rechecking, go to the troubleshooting procedures of DTCs C2121/21 to C2125/25 which indicate transmission or reception malfunctions (see page [TW-28](#)).

NG

CHECK OTHER PROBLEM (MALFUNCTION IN TRANSMISSION OR RECEPTION FUNCTION)

OK

END

DTC	C2121/21	No Signal from Transmitter ID1 in Main Mode
DTC	C2122/22	No Signal from Transmitter ID2 in Main Mode
DTC	C2123/23	No Signal from Transmitter ID3 in Main Mode
DTC	C2124/24	No Signal from Transmitter ID4 in Main Mode
DTC	C2125/25	No Signal from Transmitter ID5 in Main Mode
DTC	C2181/81	Transmitter ID1 not Received (Test Mode DTC)
DTC	C2182/82	Transmitter ID2 not Received (Test Mode DTC)
DTC	C2183/83	Transmitter ID3 not Received (Test Mode DTC)
DTC	C2184/84	Transmitter ID4 not Received (Test Mode DTC)
DTC	C2185/85	Transmitter ID5 not Received (Test Mode DTC)

TW

DESCRIPTION

The tire pressure warning valve and transmitter constantly sends radio waves to the tire pressure warning ECU.

Under the following conditions, the tire pressure warning antenna and receiver is unable to receive the signals from the tire pressure warning valve and transmitter, and a DTC is output.

- Areas, facilities, or devices that use similar radio frequencies are located in the vicinity of the vehicle.
- Devices using similar radio frequencies are used in the vehicle.

DTCs C2121/21 to C2125/25 can only be deleted by the tester. DTCs C2181/81 to C2185/85 can be deleted when the transmitter sends a forced transmission signal or the test mode ends. DTCs C2181/81 to C2185/85 are output only in the test mode.

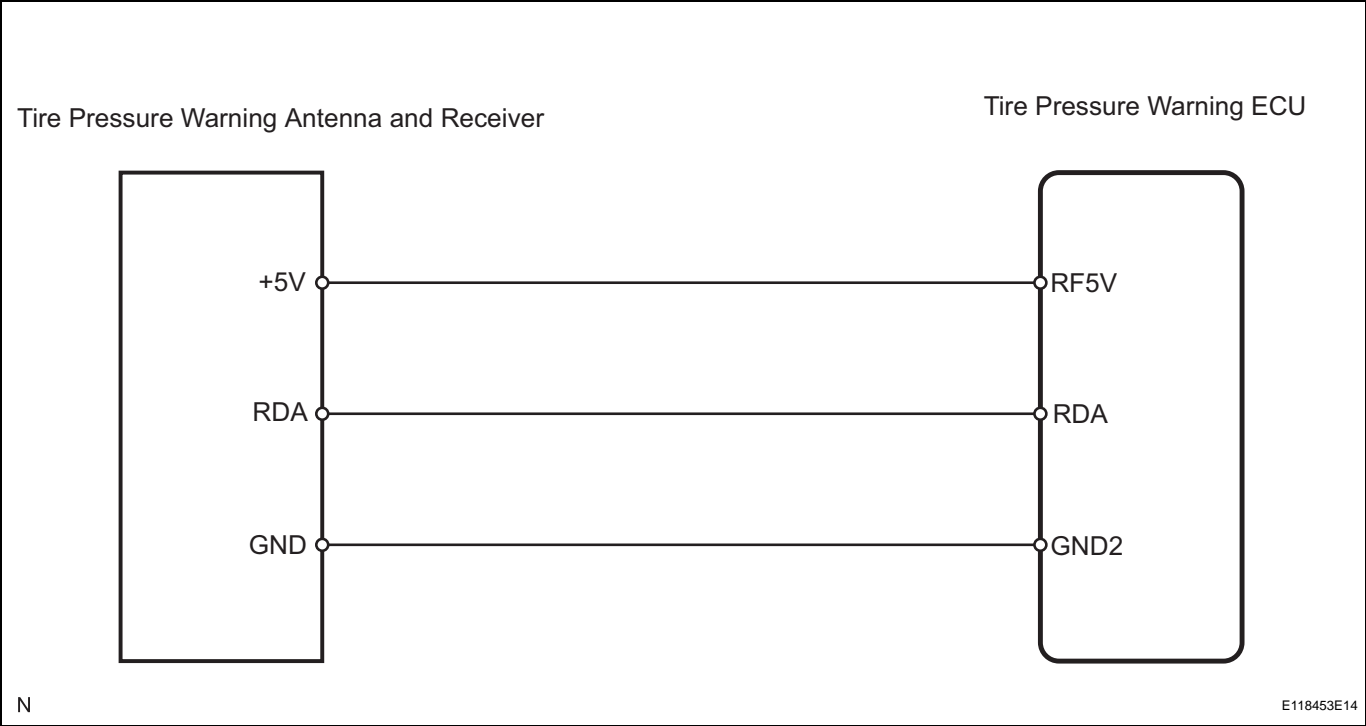
DTC No.	DTC Detection Condition	Trouble Area
C2121/21 C2122/22 C2123/23 C2124/24 C2125/25	These DTCs are detected when no signals are received for 51 minutes or more, after a vehicle speed of 5 mph (8 km/h) or more is detected and no signals are received for 12 minutes or more	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness
C2181/81 C2182/82 C2183/83 C2184/84 C2185/85	Malfunction in transmission / reception circuit	<ul style="list-style-type: none"> • Tire pressure warning valve and transmitter • Tire pressure warning antenna and receiver • Tire pressure warning ECU • Wire harness

HINT:

When no signals are received for 60 minutes or more, a DTC is output.

It is necessary to perform the procedure to identify the tire pressure warning valve and transmitter that is malfunctioning because it cannot be identified by the output DTC.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page TW-9).

1	IDENTIFY TRANSMITTER (CORRESPONDING TO DTC)
---	---

- (a) Set the pressure of each tire to the specified value.
Standard pressure:
220 kPa (2.2 kgf/cm², 32 psi)
- (b) Connect the intelligent tester (with CAN VIM) to the DLC3.
- (c) Turn the ignition switch ON.
- (d) Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS4	ID4 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

- (e) Rapidly release the tire pressure from any tire by 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by rapidly releasing the tire pressures from each tire.
- Record which TIREPRESS data (ID1 to ID5) corresponds to each tire.

- (f) Check the DATA LIST.

Result

Condition	Detection Condition
One of TIREPRESS data (ID1 to ID5) changed	Normal
No TIREPRESS data changed	Transmitter corresponding to DTC

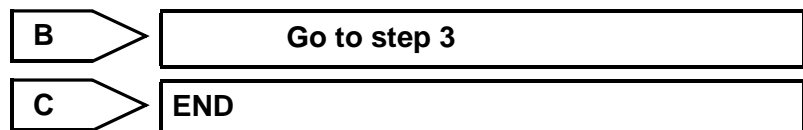
TW

NOTICE:

- It may take up to 1 minute to display the updated tire pressure data.
 - When the TIREPRESS data (IDs 1 to 5) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.
 - When the transmitter is normal, record the tire location and the transmitter ID.
- (g) When the TIREPRESS data (IDs 1 to 5) changes, repeat the same procedure on the rest of the tires (one by one) to identify which tire pressure warning valve and transmitter the DTC corresponds to.
- (h) Set the pressure of each tire to the specified value.
Standard pressure:
220 kPa (2.2 kgf/cm², 32 psi)
- (i) Check all transmitters of the tires.

Result

Result	Detection Condition
One or more of transmitters abnormal	A
All abnormal	B
All normal	C



A

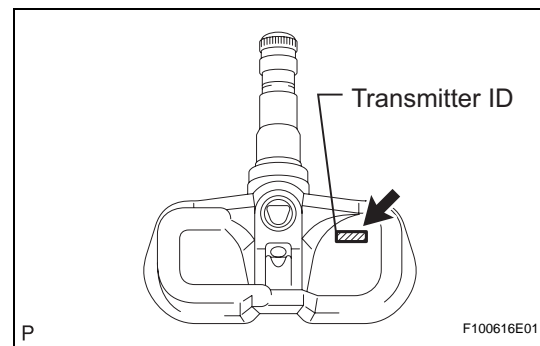
2

CHECK TIRE PRESSURE WARNING VALVE AND TRANSMITTER

- (a) Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID1 is display	-
REGIT ID2 CODE	Registered ID2 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID2 is display	-
REGIT ID3 CODE	Registered ID3 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID3 is display	-
REGIT ID4 CODE	Registered ID4 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID4 is display	-
REGIT ID5 CODE	Registered ID5 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID5 is display	-



- (b) Remove the tire pressure warning valve and transmitter and check its ID number (see page [TW-61](#)).
- (c) Check whether the recorded transmitter ID and the actual transmitter ID match.

Result

Result	Detection Condition
Unmatched	A
Matched	B

B

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

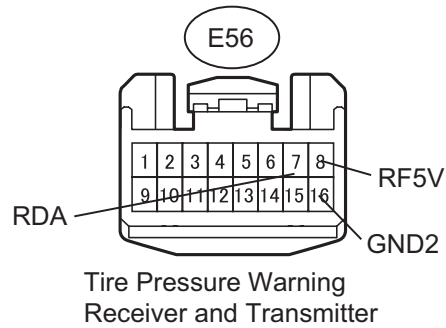
A

PERFORM REGISTRATION (TRANSMITTER ID)

3 CHECK WIRE HARNESS (ECU - RECEIVER)

Wire Harness Side

Tire Pressure Warning ECU



- Disconnect the E56 ECU connector.
- Disconnect the L20 receiver connector.
- Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E56-8 (RF5V) - L20-5 (+5V)	Below 1 Ω
E56-7 (RDA) - L20-1 (RDA)	
E56-16 (GND2) - L20-4 (GND)	

NG**REPAIR OR REPLACE HARNESS AND CONNECTOR****OK****4 READ VALUE OF INTELLIGENT TESTER (TIRE PRESSURE)**

- Check the DATA LIST tire pressure valve.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

OK:

All tire pressure readings are equal to the actual tire pressure.

NOTICE:

It may take up to 1 minute to display the updated tire pressure data.

OK

END

NG

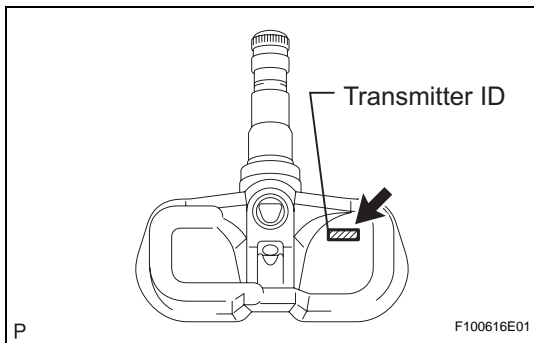
5

CHECK ID CODE (TIRE PRESSURE WARNING VALVE AND TRANSMITTER)

- (a) Select REGIT ID CODE by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID1 is display	-
REGIT ID2 CODE	Registered ID2 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID2 is display	-
REGIT ID3 CODE	Registered ID3 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID3 is display	-
REGIT ID4 CODE	Registered ID4 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID4 is display	-
REGIT ID5 CODE	Registered ID5 code/ minimum: 0 maximum: FFFFFFFF	The ID No. registered in transmitter ID5 is display	-



- (b) Remove the tire pressure monitor valve and transmitter check its ID number (see page TW-61).
 (c) Check whether the recorded transmitter ID and the actual transmitter ID match.

Result

Result	Detection Condition
Unmatched	A
Matched	B

B

REPLACE TIRE PRESSURE WARNING RECEIVER AND TRANSMITTER

A

PERFORM REGISTRATION (TRANSMITTER ID)

DTC	C2141/41	Transmitter ID1 Error
DTC	C2142/42	Transmitter ID2 Error
DTC	C2143/43	Transmitter ID3 Error
DTC	C2144/44	Transmitter ID4 Error
DTC	C2145/45	Transmitter ID5 Error

DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C2141/41 C2142/42 C2143/43 C2144/44 C2145/45	If an "ERROR" signal is received 3 times consecutively, tire pressure monitor valve will be judged as defective and this DTC will be output. This will happen in situations where inflation pressure is outside range 0 to 537.5 kPa (0 to 5.27 kgf/cm ² , 0 psi to 77.7 psi), temperature inside tire is outside specified range -40 to 215°C (-40 to 419 °F), or an error occurs in tire pressure monitor valve.	Tire pressure warning valve and transmitter

HINT:

It is necessary to perform the procedure to identify the tire pressure monitor valve that is malfunctioning because it cannot be identified by the output DTC.

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page [TW-9](#)).

1	IDENTIFY TRANSMITTER (CORRESPONDING TO DTC)
---	---

- Set the pressure of each tire to the specified value.
Standard pressure:
220 kPa (2.2 kgf /cm², 32 psi)
- Connect the intelligent tester (with CAN VIM) to the DLC3.
- Turn the ignition switch ON.
- Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

Item	Measurement Item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS3	ID3 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure/ minimum: 0 kPa (0 kgf/cm ² , 0 psi) maximum: 637.5 kPa (6.5 kgf/cm ² , 92.5 psi)	Actual tire pressure	-

NOTICE:

It may take up to 1 minute to display the updated data.

- (e) Rapidly release the tire pressure from any tire by 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by rapidly releasing the tire pressures from each tire.
- Record which TIREPRESS data (ID1 to ID5) corresponds to each tire.

- (f) Check the DATA LIST.

Result

Condition	Detection Condition
One of TIREPRESS data (ID1 to ID5) changed	Normal
None of TIREPRESS data changed	Transmitter corresponding to DTC

NOTICE:

- When the TIREPRESS data (IDs 1 to 5) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck.
 - When the transmitter is normal, record the tire location and the transmitter ID.
- (g) When one of the TIREPRESS data (IDs 1 to 5) changes, repeat the same procedure on the rest of the tires one by one to identify which tire pressure warning valve and transmitter the DTC corresponds to.
- (h) When the TIREPRESS data (IDs 1 to 5) has been changed, identify the malfunctioning tire pressure warning valve and transmitter by using recorded ID numbers and the output DTC.
- (i) Set the pressure of each tire to the specified value.

Standard pressure:

220 kPa (2.2 kgf /cm², 32 psi)

NEXT

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

DTC	C2165/65	Abnormal Temperature Inside ID1 Tire
DTC	C2166/66	Abnormal Temperature Inside ID2 Tire
DTC	C2167/67	Abnormal Temperature Inside ID3 Tire
DTC	C2168/68	Abnormal Temperature Inside ID4 Tire
DTC	C2169/69	Abnormal Temperature Inside ID5 Tire

DESCRIPTION

The tire pressure warning valve and transmitter measures tire internal temperature as well as tire pressure, and transmits the information to the tire pressure monitor receiver along with the transmitter ID. If the measured temperature is out of the specified range, the tire pressure warning ECU recognizes it as a malfunction, outputs DTCs, and blinks the tire pressure warning light.

DTC No.	DTC Detection Condition	Trouble Area
C2165/65 C2166/66 C2167/67 C2168/68 C2169/69	Tire internal temperature is outside -40 to 120°C (-40 to 246°F)	<ul style="list-style-type: none"> Tire Tire pressure warning valve and transmitter

TW

HINT:

It is necessary to perform the procedure to identify the tire pressure warning valve and transmitter that is malfunctioning because it cannot be identified by the output DTC.

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page [TW-9](#)).

1	IDENTIFY TRANSMITTER (CORRESPONDING TO DTC)
----------	--

- Set the pressure of each tire to the specified value.
Standard pressure:
220 kPa (2.2 kgf/cm², 32 psi)
- Connect the intelligent tester (with CAN VIM) to the DLC3.
- Turn the ignition switch ON.
- Select TIREPRESS by following the prompts displayed on the intelligent tester.

Tire pressure warning ECU

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID2 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

Item	Measurement item / Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

- (e) Rapidly release the tire pressure from any tire by 40 kPa (0.4 kgf/cm², 5.8 psi) for 30 seconds or more.

HINT:

- Identify the malfunctioning tire pressure warning valve and transmitter by rapidly releasing the tire pressures from each tire.
- Record which TIREPRESS data (ID1 to ID5) corresponds to each tire.

- (f) Check the DATA LIST.

TW

Result

Condition	Detection Condition
One of TIREPRESS data (ID1 to ID5) changed	Normal
No TIREPRESS data changed	Transmitter corresponding to DTC

NOTICE:

- It may take up to 1 minute to display the updated data.
 - When the TIREPRESS data (IDs 1 to 5) changes, reset the tire pressure of the tires to the specified value, rotate the tires 90 to 270° and recheck..
 - When the transmitter is normal, record the tire location and the transmitter ID.
- (g) When one of the TIREPRESS data (IDs 1 to 5) changes, repeat the same procedure on the rest of the tires (one by one) to identify which tire pressure warning valve and transmitter the DTC corresponds to.
- (h) When the TIREPRESS data (IDs 1 to 5) has been changed, identify the malfunctioning tire pressure warning valve and transmitter by using recorded ID numbers and output DTC.
- (i) Set the pressure of each tire to the specified value.

Standard pressure:

220 kPa (2.2 kgf/cm², 32 psi)

NEXT

2	CHECK TIRE
----------	-------------------

- (a) Check that the tire is not punctured, and there is no indication of air pressure drop.

OK:

Tire is normal.

NG

REPLACE TIRE AND TIRE PRESSURE
WARNING VALVE AND TRANSMITTER

OK

REPLACE TIRE PRESSURE WARNING VALVE AND TRANSMITTER

TW

DTC**C2171/71****Transmitter ID not Registered in Main Mode****DESCRIPTION**

DTC No.	DTC Detection Condition	Trouble Area
C2171/71	Transmitter ID code is not registered (when an ID code is unregistered for 51 minutes or more)	Tire pressure warning ECU

INSPECTION PROCEDURE**NOTICE:**

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure monitor ECU (see page [TW-9](#)).

HINT:

Set the tire pressure to the specified value.

Standard pressure:

220 kPa (2.2 kgf/cm², 32 psi)

TW**1****READ VALUE OF INTELLIGENT TESTER (REGISTERED ID CODES)**

- (a) Check the DATA LIST for proper functioning of the registered ID codes.

Tire pressure warning ECU

Item	Measurement item/ Range (Display)	Normal Condition	Diagnostic Note
REGIT ID1 CODE	Registered ID1 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID1 is displayed	-
REGIT ID2 CODE	Registered ID2 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID2 is displayed	-
REGIT ID3 CODE	Registered ID3 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID3 is displayed	-
REGIT ID4 CODE	Registered ID4 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID4 is displayed	-
REGIT ID5 CODE	Registered ID5 code / min.: 0, max.: FFFFFFFF	The ID No. registered in the transmitter ID5 is displayed	-

OK:

The registered transmitter ID codes are displayed on the intelligent tester screen.

OK**REPLACE TIRE PRESSURE WARNING ECU****NG****2****PERFORM REGISTRATION (TRANSMITTER ID)**

- (a) Register the transmitter IDs for all the wheels (see page [TW-9](#)).
- (b) Set the pressure of each tire to the specified value.

Standard pressure:

220 kPa (2.2 kgf/cm², 32 psi)

NEXT

3	READ VALUE OF INTELLIGENT TESTER (TIRE PRESSURE)
----------	---

(a) Check the DATA LIST tire pressure value.

Tire pressure warning ECU

Item	Measurement item/ Range (Display)	Normal Condition	Diagnostic Note
TIREPRESS1	ID1 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS2	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS3	ID3 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS4	ID4 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-
TIREPRESS5	ID5 tire pressure / min.: 0 kPa (0 kgf/cm ² , 0 psi), max.: 637.5 kPa (6.48 kgf/cm ² , 92.2 psi)	Actual tire pressure	-

OK:

All tire pressure readings are equal to the actual tire pressure.

NOTICE:

It may take up to 1 minute to display the tire pressure data.

NG

REPLACE TIRE PRESSURE WARNING ECU

OK

END

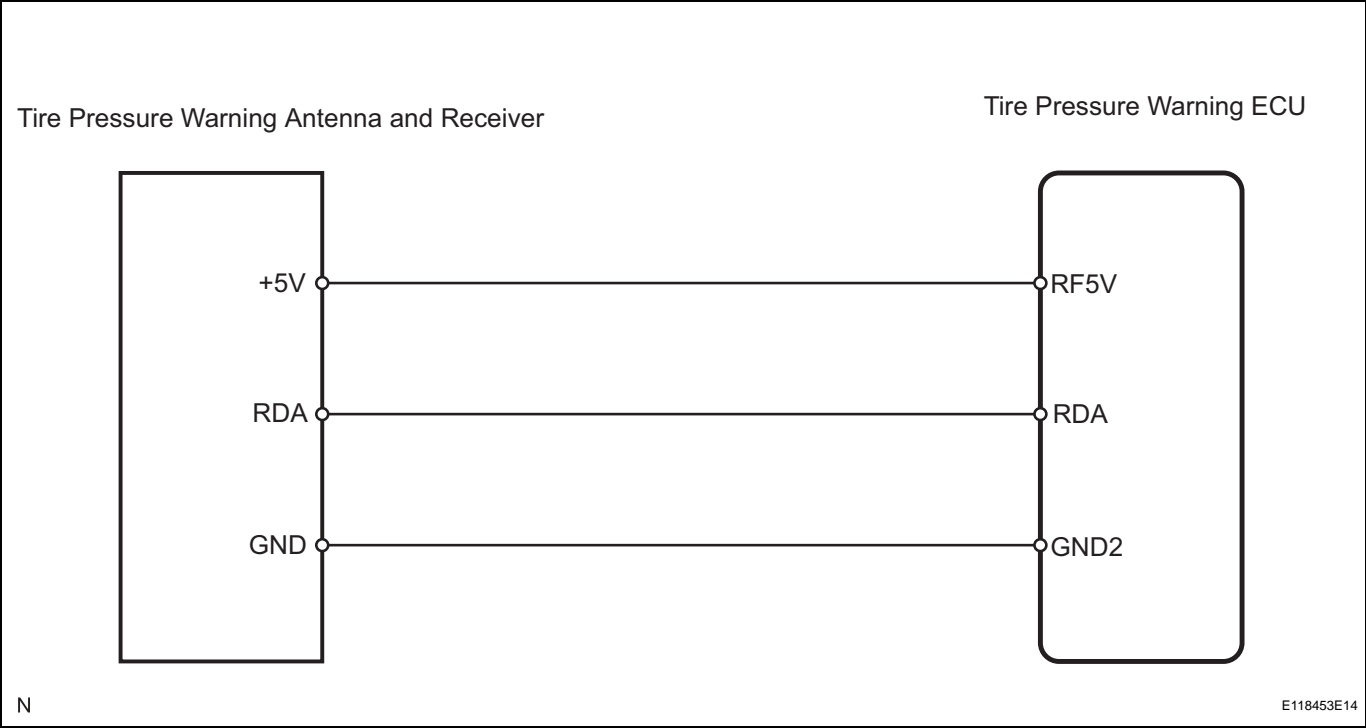
TW

DTC	C2176/76	Receiver Error
-----	----------	----------------

DESCRIPTION

DTC No.	DTC Detection Condition	Trouble Area
C2176/76	DTC is stored when either of following is detected: <ul style="list-style-type: none">Malfunction in tire pressure warning ECU internal circuit.Terminal RF5V is shorted to ground.	<ul style="list-style-type: none">Tire pressure warning antenna and receiverTire pressure warning ECUWire harness

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

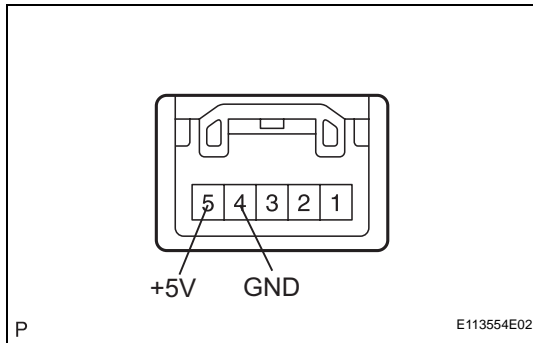
It is necessary to register an ID code after replacing the tire pressure warning valve abd transmitter and/or the tire pressure warning ECU (see page TW-9).

HINT:

Set the tire pressure to the specified value.

Standard pressure:

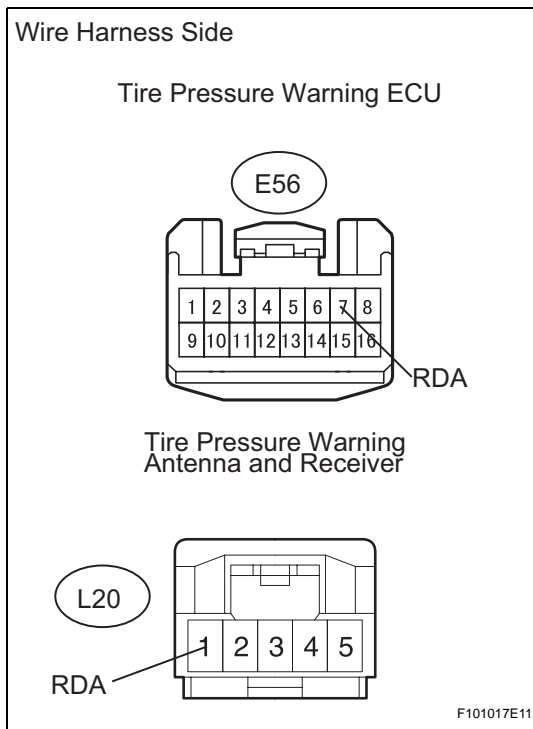
220 kPa (2.2 kgf/cm², 32 psi)

1 CHECK TIRE PRESSURE WARNING ECU

(a) Measure the voltage of the connector.

Standard voltage

Tester Connection	Switch Condition	Specified Condition
L20-5 (+5V) - L20-4 (GND)	Ignition switch ON	4.5 to 5.5 V

NG**Go to step 5****OK****2 CHECK WIRE HARNESS (ECU - RECEIVER)**

- (a) Disconnect the E56 ECU connector.
 (b) Disconnect the L20 receiver connector.
 (c) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E56-7 (RDA) - L20-1 (RDA)	Below 1 Ω

NG**REPAIR OR REPLACE HARNESS AND CONNECTOR****OK****3 REPLACE TIRE PRESSURE WARNING ANTENNA AND RECEIVER****NEXT****4 CHECK DTC**(a) Check for DTC (see page [TW-20](#)).**OK:****DTC is not output.****TW**

- HINT:
- It is necessary to register an ID when replacing the tire pressure warning ECU (see page TW-9).
 - Read ID on the DATA LIST before removing the tire pressure warning ECU. Register the ID in the new tire pressure warning ECU.

NG

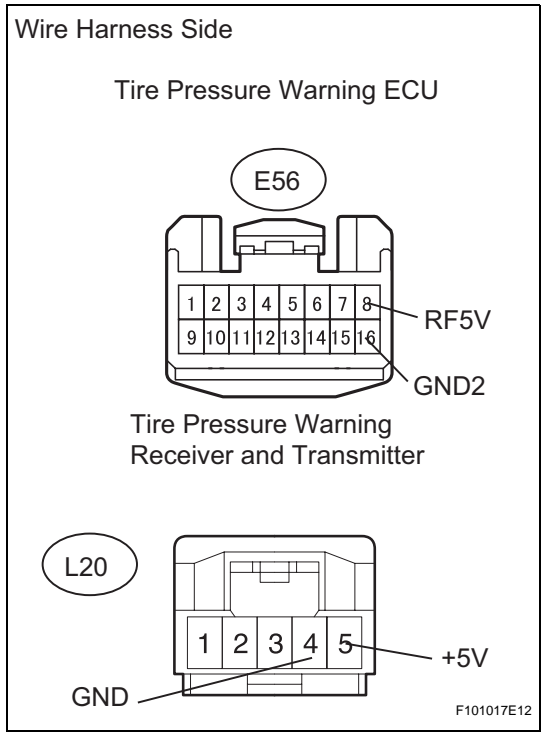
REPLACE TIRE PRESSURE WARNING ECU

OK

END

5

CHECK WIRE HARNESS (ECU - RECEIVER)



- (a) Disconnect the E56 ECU connector.
- (b) Disconnect the L22 receiver connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E56-8 (GND2) - L20-4 (GND)	Below 1 Ω
E56-8 (RF5V) - L20-5 (+5V)	

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

REPLACE TIRE PRESSURE WARNING ECU

TW

DTC**C2191/91****Vehicle Speed Signal Error (Test Mode DTC)****DESCRIPTION**

The tire pressure warning ECU receives a speed signal from the combination meter. This DTC is stored upon entering test mode, and cleared when a vehicle speed signal of 12 mph (20 km/h) is detected for 3 seconds or more. The DTC is output only in test mode.

DTC No.	DTC Detection Condition	Trouble Area
C2191/91	Speed sensor circuit malfunction	<ul style="list-style-type: none"> Vehicle speed sensor Tire pressure warning ECU Combination meter Wire harness

WIRING DIAGRAM**INSPECTION PROCEDURE****NOTICE:**

It is necessary to register an ID code after replacing the tire pressure warning valve and transmitter and/or the tire pressure warning ECU (see page [TW-9](#)).

1**READ VALUE OF INTELLIGENT TESTER (VEHICLE SPEED)**

- (a) Check the DATA LIST for proper functioning of the vehicle speed signal.

Tire pressure warning ECU

Item	Measurement item / Range(Display)	Normal Condition	Diagnostic Note
VEHICLE SPEED	Vehicle speed reading / Min.: 0 km/h (0 mph) Max.: 255 km/h (158 mph)	Actual vehicle speed	Speed indicated on the combination meter

OK:
Indicates actual speed.

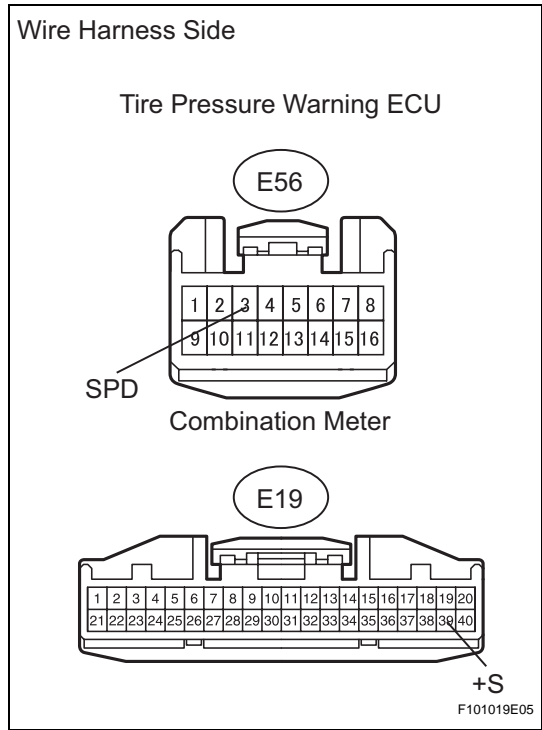
OK

REPLACE TIRE PRESSURE WARNING ECU

NG

2

CHECK WIRE HARNESS (ECU - METER)



- (a) Disconnect the E56 ECU connector.
- (b) Disconnect the E19 meter connector.
- (c) Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E56-3 (SPD) - E19-39 (+S)	Below 1 Ω
E56-3 (SPD) - Body ground	10 kΩ or higher

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

3 CHECK TIRE PRESSURE WARNING ECU

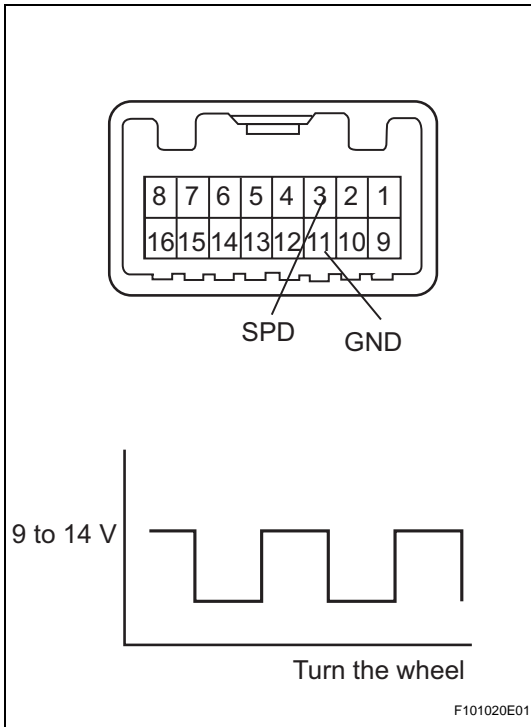
(a) Measure the voltage of the connector.

Standard voltage

Tester Connection	Condition	Specified Condition
E56-3 (SPD) - E56-11 (GND)	While driving vehicle	Pulse generation

HINT:

As the vehicle speed (wheel revolution speed) increases, a cycle of the waveform narrows.

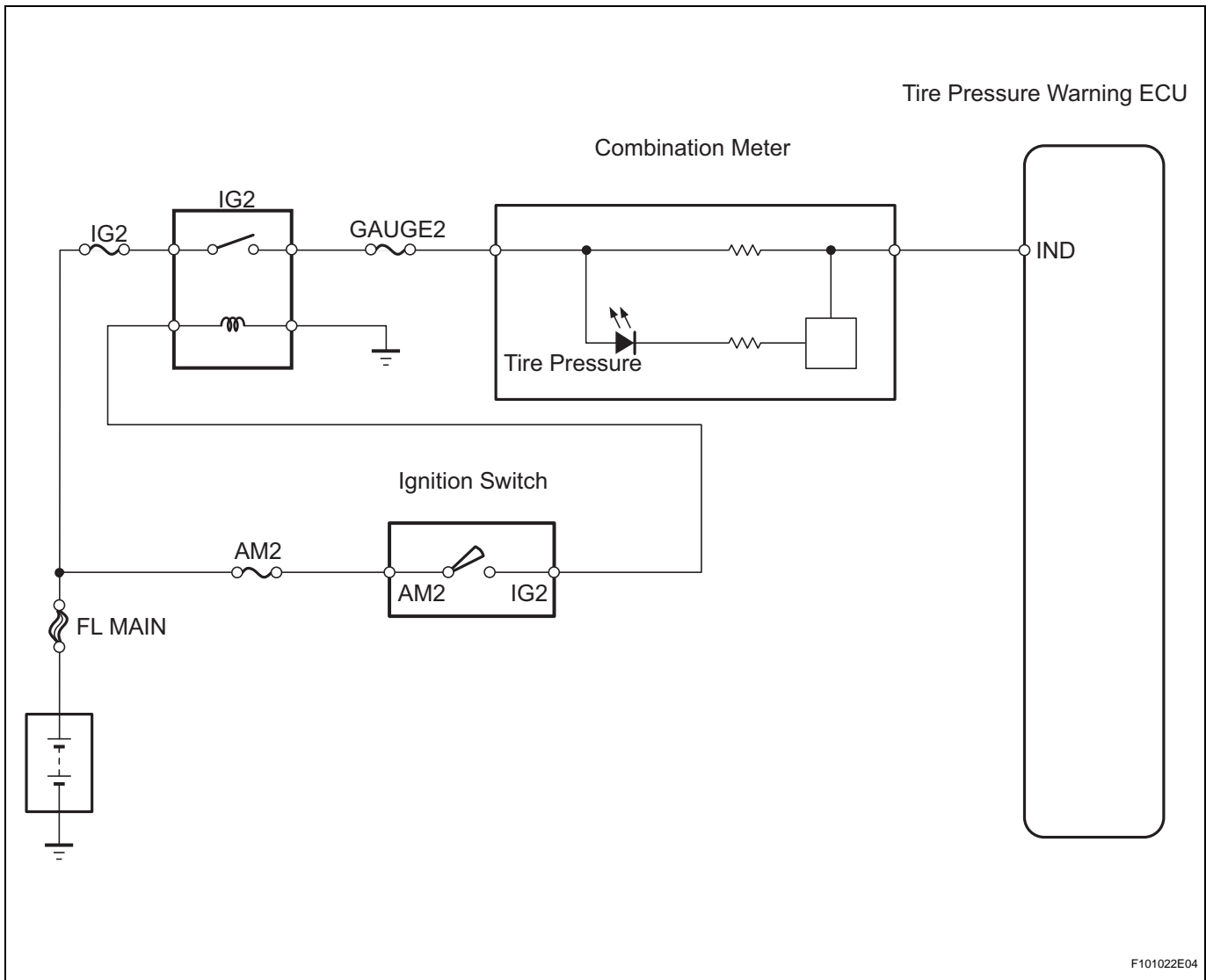
NG**GO TO METER / GAUGE SYSTEM****OK****REPLACE TIRE PRESSURE WARNING ECU****TW**

Tire Pressure Warning Light Circuit

DESCRIPTION

If the tire pressure warning ECU detects trouble, the tire pressure warning light turns on and tire pressure monitor is canceled at the same time. At this time, the ECU records a DTC in memory. Connect terminals TC and CG of the DLC3 to make the tire pressure warning light blink and output the DTC.

WIRING DIAGRAM



F101022E04

INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure monitor valve and/or the tire pressure warning ECU (see page [TW-9](#)).

1

INSPECT FUSE (GAUGE)

- (a) Remove the GAUGE fuse from the instrument panel junction block.

(b) Measure the resistance of the fuse.

Standard resistance:

Below 1 Ω

NG

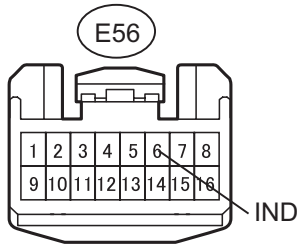
REPLACE FUSE

OK

2

CHECK TIRE PRESSURE WARNING LIGHT CIRCUIT

Wire Harness Side



F101023E01

- Disconnect the E56 ECU connector.
- Using a service wire, connect E56-6 (IND) on the wire harness side and body ground.
- Turn the ignition switch ON.
- Check that the tire pressure warning light turns on.

OK:

Tire pressure warning light turns on.

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

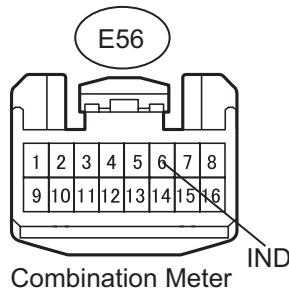
NG

3

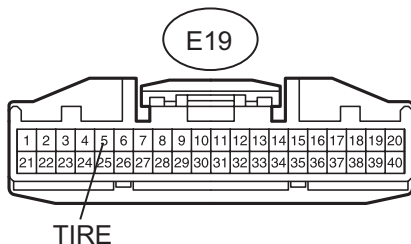
CHECK WIRE HARNESS (ECU - METER)

Wire Harness Side

Tire Pressure Warning ECU



Combination Meter



F101019E06

- Disconnect the E56 ECU connector.
- Disconnect the E19 meter connector.
- Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E56-6 (IND) - E19-5 (TIRE)	Below 1 Ω

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

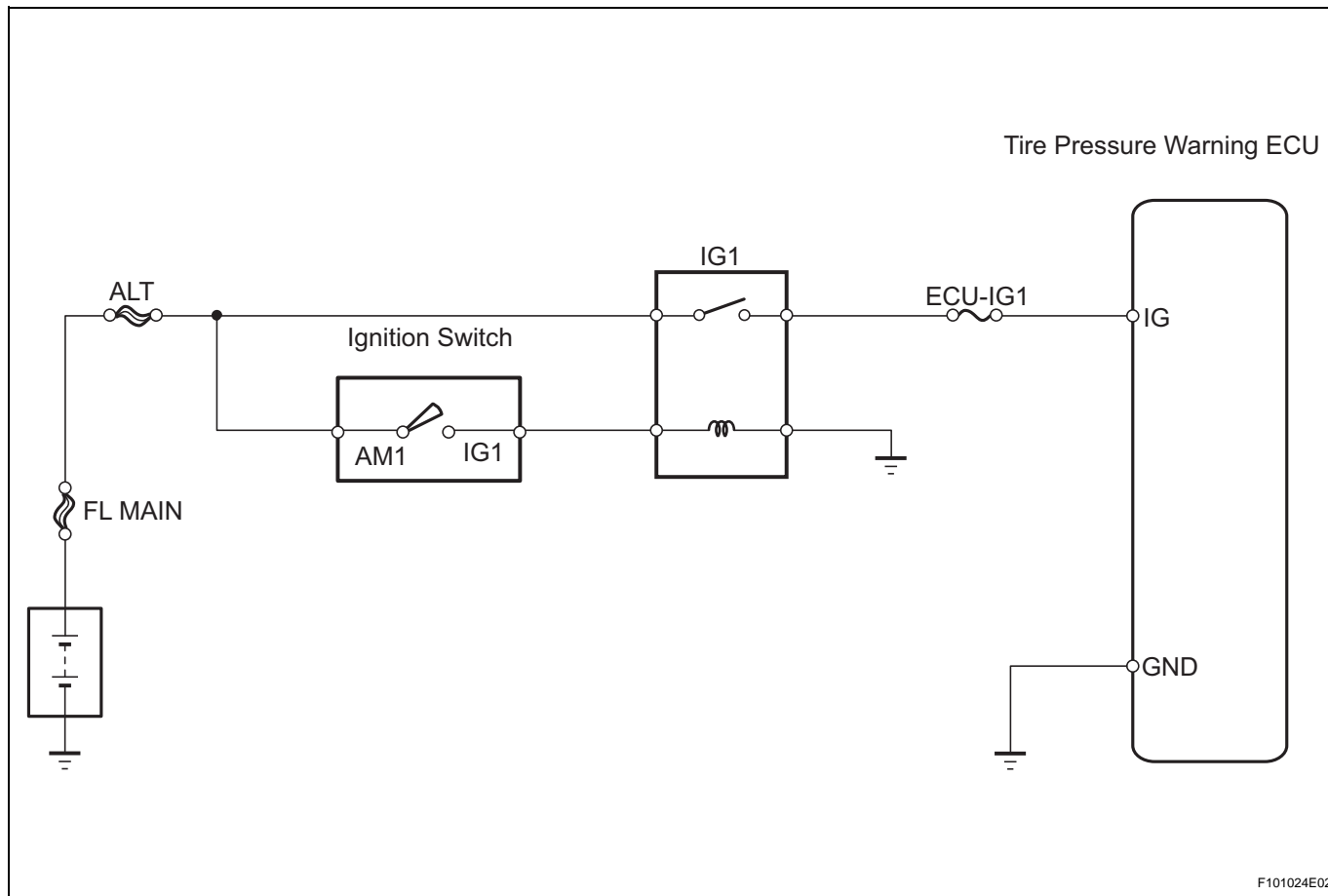
TW

ECU Power Source Circuit

DESCRIPTION

This is the power source for the tire pressure warning ECU.

WIRING DIAGRAM



INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure monitor valve and/or the tire pressure warning ECU (see page [TW-9](#)).

1

INSPECT FUSE (ECU-IG1)

- Remove the ECU-IG1 fuse from the instrument panel junction block.
- Measure the resistance of the fuse.

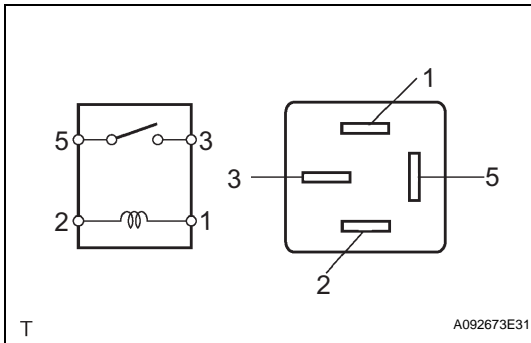
Standard resistance:

Below 1 Ω

NG

REPLACE FUSE

OK

2 INSPECT IG1 RELAY

- (a) Remove the IG1 relay from the instrument panel junction block.

- (b) Measure the resistance of the relay.

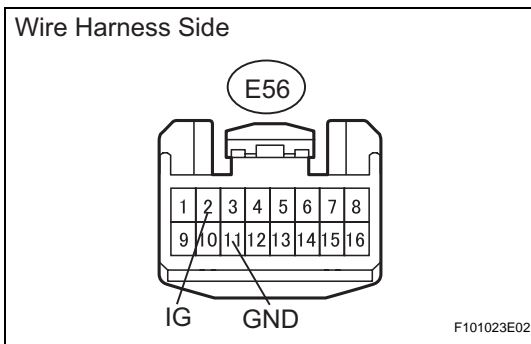
Standard resistance

Tester Connection	Specified Condition
3 - 5	10 k Ω or higher
	Below 1 Ω (When battery voltage is applied to terminals 1 and 2)

NG

REPLACE IG1 RELAY

OK

3 INSPECT WIRE HARNESS (ECU - BATTERY AND BODY GROUND)

- (a) Disconnect the E56 ECU connector.

- (b) Measure the voltage of the wire harness side connector.

Standard voltage

Tester Connection	Switch Condition	Specified Condition
E56-2 (IG) - Body ground	Ignition switch ON	10 to 14 V
	Ignition switch OFF	Below 1 V

- (c) Measure the resistance of the wire harness side connector.

Standard resistance

Tester Connection	Specified Condition
E56-11 (GND) - Body ground	Below 1 Ω

NG

REPAIR OR REPLACE HARNESS AND CONNECTOR

OK

PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE

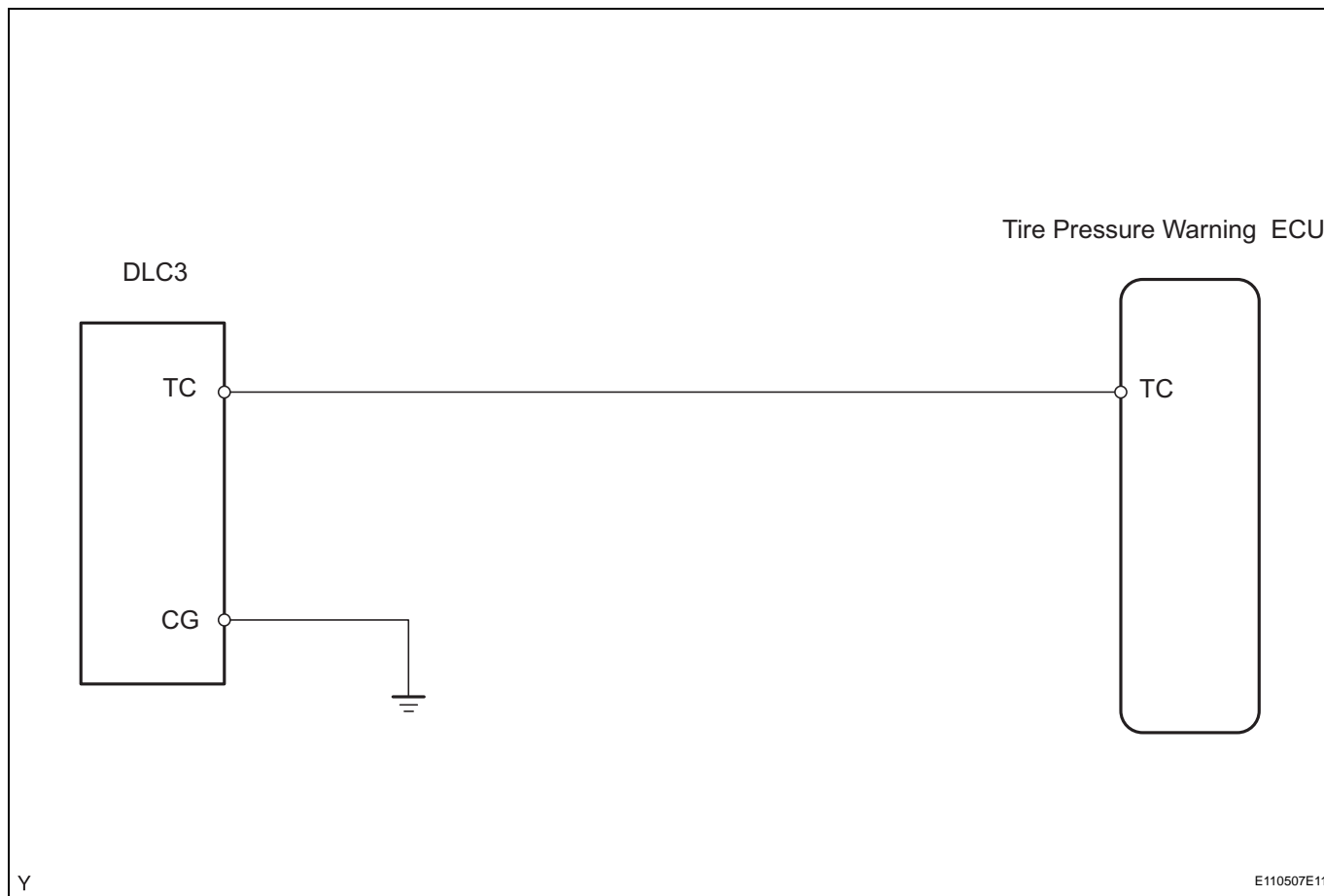
TW

TC and CG Terminal Circuit

DESCRIPTION

DTC output mode is set by connecting terminals 13 (TC) and 4 (CG) of the DLC3. The DTCs are indicated by the blinking of the tire pressure warning light.

WIRING DIAGRAM



HINT:

When each warning light continues blinking, a ground short in the wiring of terminal TC of the DLC3 or an internal ground short in each ECU may have occurred.

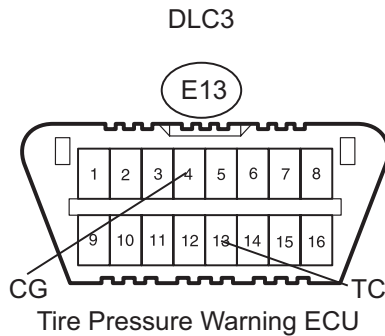
INSPECTION PROCEDURE

NOTICE:

It is necessary to register an ID code after replacing the tire pressure monitor valve and/or the tire pressure warning ECU (see page [TW-9](#)).

1 CHECK WIRE HARNESS (DLC3 - ECU)

Wire Harness Side



F101025E02

- Disconnect the E13 DLC3 connector.
- Disconnect the E56 ECU connector.
- Measure the resistance of the wire harness side connectors.

Standard resistance

Tester Connection	Specified Condition
E56-12 (TC) - E13-13 (TC)	Below 1 Ω
E13-4 (CG) - Body ground	

NG**REPAIR OR REPLACE HARNESS AND CONNECTOR****OK****PROCEED TO NEXT CIRCUIT INSPECTION SHOWN IN PROBLEM SYMPTOMS TABLE****TW**